Manufacturers Record

IN THE SOUTH IS OPPORTUNITY

An outstanding Southern center of industry and opportunity is shown in this photograph of Atlanta, Georgia.

The widening horizon of Southern development is claiming increasing attention from investors and manufacturers.

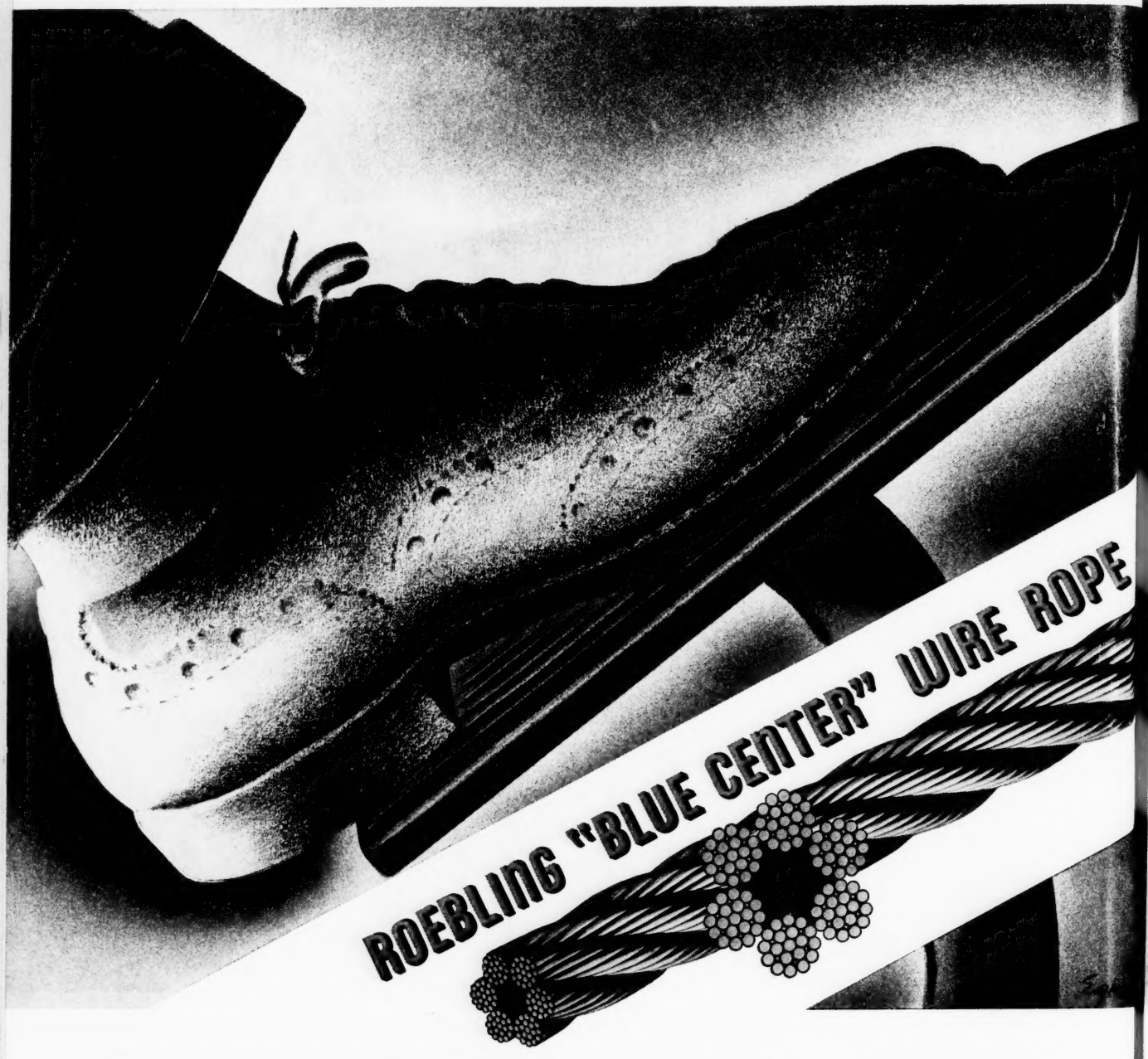
Read the description in this issue of the new plant at Fernandina, Florida, of the Rayonier Corporation, a Northwestern pioneer in pulp manufacture, now for the first time entering the South to make rayon and other pulps from Southern pine by the sulphite process.

Read the article by James A. Farrell, Chairman of the National Foreign Trade Council on changing economic boundaries, and conditions affecting an expanding market for United States shippers in reaching the buying power of foreign countries.

A great part of this commerce will flow through Southern Ports.

FEBRUARY 1940

PUT THE BRAKES ON HIGH ROPE COSTS!



Lowest general-average rope operating cost is assured through the use of Roebling "Blue Center" Wire Rope. The result of continuous research and development, this rope is the finest product of Roebling's unexcelled research, steel-making and rope-fabricating facilities. Ask about Roebling's "Blue Center" Wire Rope... either standard or preformed.

JOHN A. ROEBLING'S SONS COMPANY, TRENTON, N. J.
BRANCHES IN PRINCIPAL CITIES

STRONGER—Wire of highest strength consistent with ductility and toughness

TOUGHER—Provides maximum resistance against wear, sudden shocks, vibration

SAFER—Unequalled for uniformity of quality

SAVING—Insures lowest general average operating cost

"*The* SOUTH'S RESOURCES"

soon to appear

Increasing utilization of the resources nature has given the Southern States is reflected in the figures of manufacturing growth of this section--a remarkable record as compared with the rest of the United States.

Here is a frontier for business achievement that will contribute to the wealth of the country.

"The development of the South means the enrichment of the Nation"

What "The South's Resources" will be

This issue will show by means of seventeen two-page three-color maps (including each Southern state and the South as a whole) the nature and location of commercial physical resources, accompanied by facts bearing upon the states' industrial opportunities. The practical value of the assemblage of such facts cannot be over-emphasized.

Types of industries appropriate will be indicated; each state will appear in alphabetical order. There will be pictures of typical plants showing examples that are successfully utilizing Southern resources.

Nothing like this has been attempted before.

The facts and descriptive material will not be found anywhere else under one cover or in such convenient accessible form.

A work that meets with enthusiastic approval

Through its presentation of facts and figures, and in pointing to the wealth producing opportunities in the South since 1882, the MANUFACTURERS RECORD helps to attract capital to the South; it aids in bringing appropriate industries where products can be profitably made at the source of raw materials; it aids in bringing a better balance between agriculture and manufacturing; it encourages utilities, railroads and manufacturers in their constructive undertakings, and unceasingly calls attention to the unequalled assets of the South as a developing industrial empire. Its defense of the South against stigmatic criticisms is well known and its material is circulated from coast to coast.

The MANUFACTURERS RECORD receives the wholehearted endorsement of public men such as governors of Southern states and successful business executives, who constantly feel the influence of its constructive work.

Read about all this in our 16 page folder, sent upon request.

"THE SOUTH'S RESOURCES" $1.00 per copy

Included in all MANUFACTURERS RECORD subscriptions at regular annual price of two dollars.

Advertising rates on request.

MANUFACTURERS RECORD

BALTIMORE, MARYLAND

The Case* of CONDENSATE THAT CRIPPLED

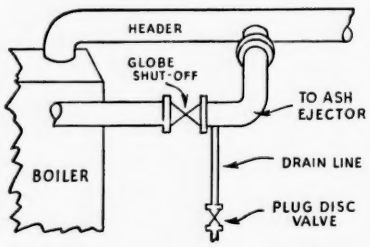
SOLVED WITH PREVENTIVE MAINTENANCE

"I'm sick of this condensate problem!" moaned the BIG BOSS. "Some day it will wreck our plant!"

"That valve seat is cut to pieces," said the ENGINEER, ". . . and we just put it into the line."

"Preventive Maintenance," offered the CRANE REPRESENTATIVE, "... with the right equipment should stop the trouble. Let's have a look!"

WE don't know that such conversation ever took place, but it might well have, in view of the facts of the case. In the power plant of a hosiery mill, steam was piped to an ash ejector, direct from the main header. There was some 12 or 14 feet of 2½" pipe between the header and the ejector line shut-off valve, as shown in the sketch below.



As a result, there always was a leg of condensate ahead of the valve. Each time the valve was opened, the severe cutting action of the water traveling at high velocity did serious damage to its seating surfaces.

Ordinary maintenance was useless. This globe valve was everlastingly being repaired or replaced. The Engineer saw that Preventive Maintenance—as suggested by G. W. H., the Crane Man—was necessary. Together they attacked the trouble at its source.

Preventive Maintenance counseled the installation of a small drain line with a Crane plug disc valve through which the condensate could be drained before the globe valve was opened. This was done.

Results: (1) The trouble was entirely eliminated. (2) The life of the globe valve was extended manifold. (3) Another user of piping equipment learned the economy of Preventive Maintenance, and of looking to Crane for the right valves and fittings for every need, common or extraordinary; also, of the wisdom of calling in the Crane Man on every flow control problem.

**This case is based on an actual experience of a Crane Representative in our Indianapolis Branch.*

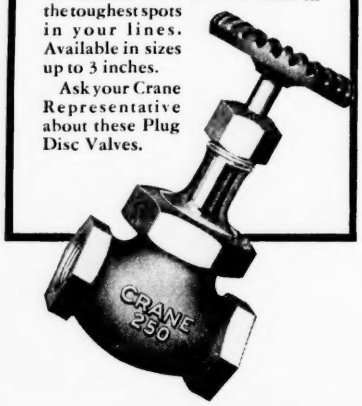
FOR TOUGH THROTTLING JOBS USE CRANE PLUG DISC VALVES

For throttling and other severe piping jobs at pressures from 150 to 350 pounds steam at 550°F., you can't make a better choice than Crane Brass Plug Disc Valves.

The extra stamina of these Crane valves is in their disc and seat metals—just the right combination for highest resistance to wire-drawing, erosion and corrosion under actual working conditions. The same care in the selection of body materials, sound design, extra strength and perfect balance in every part, result in valves from which you may expect unusual performance.

In services up to 250 pounds steam pressure, this Crane No. 212P will give you dependable, economical flow control—even in the toughest spots in your lines. Available in sizes up to 3 inches.

Ask your Crane Representative about these Plug Disc Valves.



1940 our 85th YEAR

CRANE

CRANE CO., GENERAL OFFICES: 836 S. MICHIGAN AVE., CHICAGO

VALVES · FITTINGS · PIPE
PLUMBING · HEATING · PUMPS

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS

TABLE OF CONTENTS

FEBRUARY, 1940

Volume 109, Number 2

EDITORIALS

In the South is Opportunity ..... Cover
The South Scores Again 19
Law Without Justice 20
States Rights 20
Opportunity 21

FEATURE ARTICLES

Changing Economic Boundaries by James A. Farrell 22
New Carload Freight Rates 24
Rayonier Makes Eastern Debut 25
Southern Highway Developments by H. J. McDargh 26
Bridging the Mississippi River by John A. Fox 28
Naval Stores Studies by Carl F. Speh 30
Richmond's Deepwater Terminal 32
Syrup From Sweet Potato Starch by Lawrence E. Stout 33
South's Contracts Total $59,262,000 in January 34
New Industrial Plants and Expansions in the South During January, 1940 36
Louisiana's Shrimp Industry 50
Out of the Red by Henry F. Unger 52
Mica Production in North Carolina 58

DEPARTMENTS

Letters and Comments 7
New Ways of Doing Things 38
Financial 40
Industrial News 44
Trade Literature 46
Index for Buyers 64
Index of Advertisers 66

Cover illustration of Atlanta, Georgia, by courtesy of the Atlanta, Georgia, Chamber of Commerce.

MANUFACTURERS RECORD

Devoted to the Upbuilding of the Nation Through the Development of the South and Southwest as the Nation's Greatest Material Asset

Published Monthly by the
MANUFACTURERS RECORD PUBLISHING CO.
FRANK GOULD, President

Main Office: Manufacturers Record Building, Commerce and Water Streets, Baltimore, Md. Phone: Plaza 7080-1.
Branch Offices: New York—11 W. 42nd St. Phone: Longacre 5-7180.
Chicago—28 East Jackson Blvd., Room 1510. Phone: Harrison 5867.
Cleveland, O.—850 Euclid Ave., Room 310. Phone: Cherry 4050.

Subscription Rates: One Year $2.00, Two Years $3.00. Single Copies 25c, back numbers over 3 months old 50c. Other Publications of the Manufacturers Record Publishing Co. Construction (daily and monthly issues) $10.00 a year. Construction (monthly issues only) $2.00 a year. Blue Book of Southern Progress (annual) $1.00 per copy.

Member A.B.C.

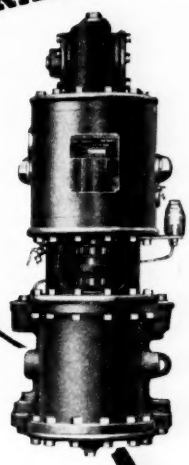
Entered as second class matter at the postoffice, Baltimore, Md., U.S.A., under act of March 3, 1879. Volume 109, Number 2 Monthly

Before You Buy

Investigate!

AIR COMPRESSORS by Westinghouse AIR BRAKE CO.

ONE of the MANY Types



Single Stage Steam Driven

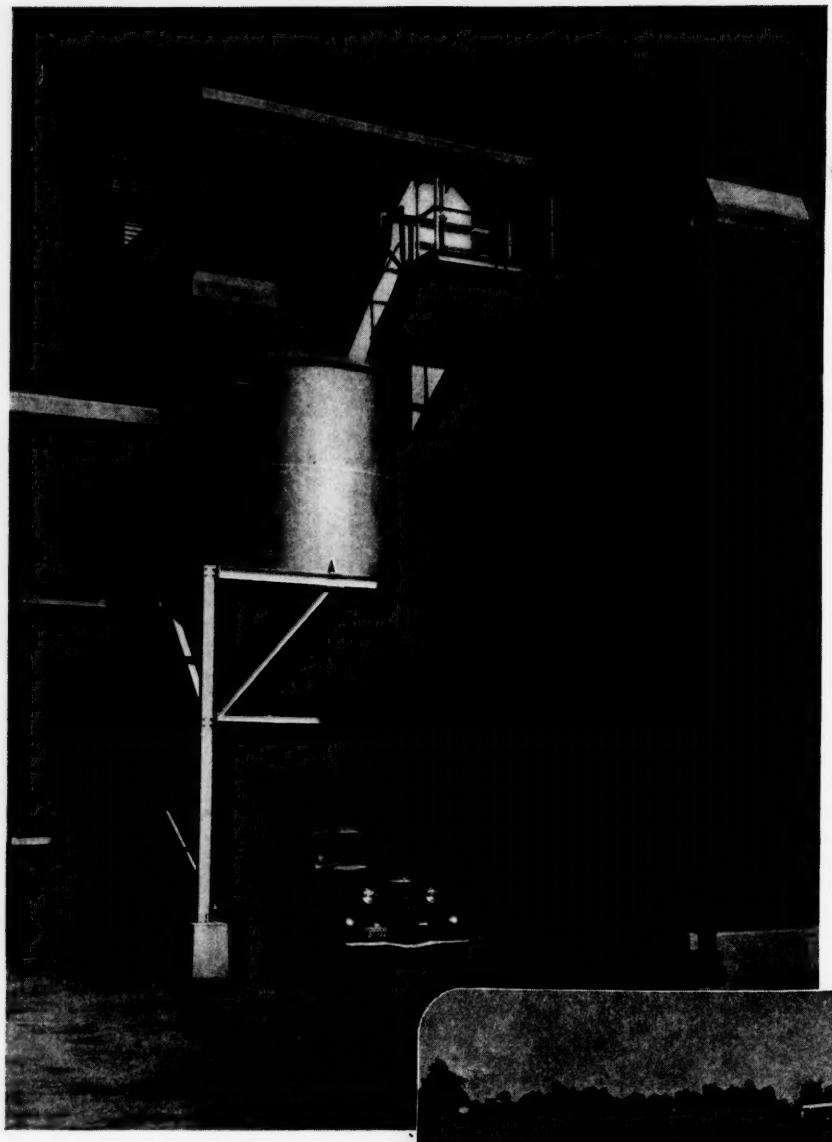
Sturdy locomotive type. Gives long-time service for factory use. Easily installed on post, wall, or stand. For 80 lbs. air and 100 lbs. steam. Sizes 35, 49, and 66 cu. ft. Larger size available, 150 cu. ft., two stage type. » » » » »

Also many types of motor driven compressors up to 200 cu. ft., having exclusive features, and noted for economy, reliability, and durability. »

Write for Literature and Prices

70 Years Experience

Westinghouse . . . .
AIR BRAKE CO.
Industrial Division
PITTSBURGH, PA.



Sure

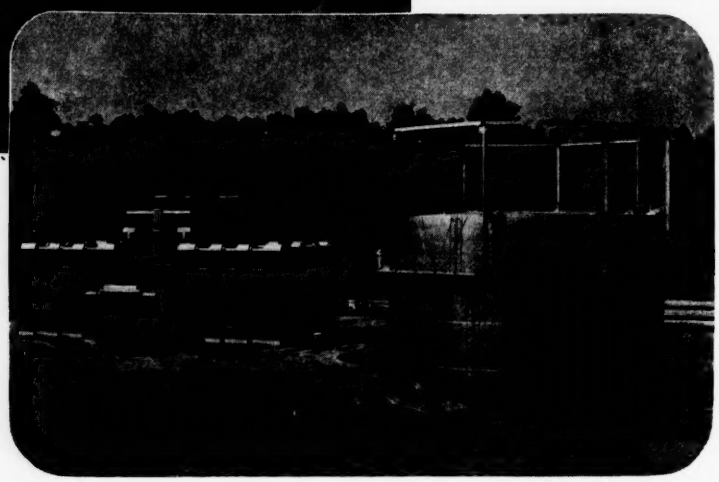
you can use STEEL TANKS AT SEWAGE DISPOSAL PLANTS!

A steel tank, as shown at the left, provides a convenient method of handling sludge at sewage disposal plants. Steel construction can also be used for digesters, gas holders and elevated tanks to provide water for general service.

Steel is impervious, preventing seepage. Welding eliminates the danger of leakage at the joints and uneven settlement will not cause cracking.

When painted regularly the cost of maintaining a steel structure is low and long life results in a low annual investment cost.

GAS produced in digesters at disposal plants may be utilized for heating purposes or generating power for pumping by installing a holder to provide a uniform supply. The 30,000 cu. ft. lift type holder at the right is used for this purpose. Where it is desirable to store the gas under pressure, Hortonspheres are often installed. When planning a modern sewage disposal plant, write for our estimates on the steel tanks and plate work.



Elevated steel sludge tank (top) and 30,000 cu. ft. lift type gas holder of welded construction of Greensboro, N. C. sewage disposal plant.

CHICAGO BRIDGE & IRON COMPANY

Birmingham	1530 North Fiftieth Street	New York	3313-165 Broadway Bldg.	Philadelphia	1619-1700 Walnut Street Bldg.
Dallas	1408 Liberty Bank Bldg.	Cleveland	2216 Rockefeller Bldg.	Detroit	1510 Lafayette Bldg.
Houston	2919 Main Street	Chicago	2106 Old Colony Bldg.	Boston	1510 Consolidated Gas Bldg.
Tulsa	1611 Hunt Bldg.	San Francisco	1040 Rialto Bldg.	Havana	Edificio Abreu 402

B-623

Plants in BIRMINGHAM, CHICAGO and GREENVILLE, PA.

» » » LETTERS « « « AND COMMENTS

Railroad Requirements

Editor, MANUFACTURERS RECORD:

The enactment into law at the present session of Congress of S. 2009, commonly known as the Omnibus Transportation Bill, will be a decided step toward giving the railroads a square deal in the field of transportation. The bill, passed by both Houses of Congress at the last session, and now with Senate and House conferees, is designed to correct some of the inequalities of competition between the railroads on one hand and the highway and water carriers on the other, by fair regulation of all modes of transportation. In other words, the railroads have been subjected to unequal and destructive competition for many years. S. 2009, if enacted, should be a definite help in the rehabilitation of the railways.

S. F. SMALL, Vice-President,
Norfolk & Western Rwy. Co.,
Roanoke, Virginia

Editor, MANUFACTURERS RECORD:

I have read Mr. Parmelee's statement in the January MANUFACTURERS RECORD carefully and with the greatest interest. His handling of this important matter is correct and conclusive. Nothing more need be said in that connection.

The railroads have demonstrated that they can handle acceptably any business or emergency put upon them. All that the railways need is an application of Jefferson's statement, "Equal and Exact Justice to All, Special Privileges to None."

RUTLEDGE SMITH, Asst. to President,
Tennessee Central Railway Company,
Nashville, Tennessee

Editor, MANUFACTURERS RECORD:

In addition to more business, which practically every transportation agency needs, what, in my opinion, is needed not only for the railroads, but in the public interest, is an equalization of laws to prevent unnecessary duplications and additions to transportation service. Now, and in recent years, government has been spending millions of dollars on inland waterways. There are no hearings as to whether this is essential in the public interest, no requirements for certificates of convenience and necessity, such as the railroads must obtain before building additional lines, and no consideration apparently is given as to the adequacy of existing transportation facilities.

The same situation prevails as to pipe lines. The federal government has been spending millions to improve the navigation of the Tennessee River. Right now there is in the process of construction a pipe line from Port St. Joe, Florida to Atlanta and Chattanooga—the latter on the Tennessee River—which will be used for the transportation of gasoline. There was no hearing as to the necessity, in the public interest, for this new transportation facility, no effort to determine whether there was any lack of adequate facilities, etc. If this pipe line is built as contemplated, then, obviously, a part of the justification for canalizing the Tennessee River to Chattanooga ceases to exist. At the same time, railroads, with established facilities, will have less business to haul.

The general transportation situation is in a state of chaos because of the failure of constituted authority to deal in the same way with various forms of transportation. It is not simply railroad interests which are at stake, but the public interest. The transportation machine of this country has been so extended and overbuilt that, even with much more business than now obtains, all the existing agencies could not possibly make money—and a bankrupt transportation system certainly is not in the public interest.

FITZGERALD HALL, President,
Nashville, Chattanooga & St. Louis Rwy.,
Nashville, Tennessee

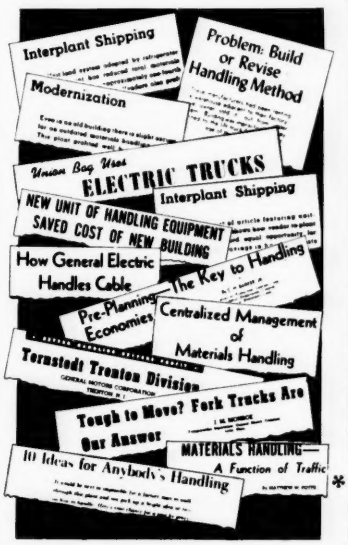
(*Continued on page 9*)

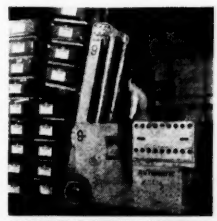
"AUTOMATIC" USERS ARE SAVING THOUSANDS OF DOLLARS WITH IMPROVED MATERIALS HANDLING · · · WITH MODERN *Electric Propelled* FORK TRUCK SYSTEMS

Many industries have re-organized their materials handling from haphazard uncontrolled methods to a scientific profitable basis with "AUTOMATIC" Fork Truck Systems. These installations have made possible such following factors so vital to the success of modern business. 1. More manufacturing space for actual production. 2. Assurance of scheduled steady flow of materials, parts, to various processes, assemblies, etc. 3. Reduction of in-process inventories and minimum manufacturing cycles. 4. Delivery of materials at heights convenient to workers and production, thus eliminating needless rehandling and manual lifting. 5. Improved stock-keeping as unit loads permit simplified orderly inventory process. 6. Safer working conditions and better housekeeping, through elimination of manual hazardous handling methods. 7. Reduced shipping costs through unit load pallet methods, less packing material and elimination of bracing box cars. All these facts as customers have written them are available as compiled in a **Special Bulletin* fully descriptive and illustrative. Just write for the "AUTOMATIC" Special Fork Truck Bulletin.

***SPECIAL BULLETIN**

Compiled for your reference from articles on "Automatic" Fork Truck Systems which appeared in leading trade publications during 1939.


Interplant Shipping
Problem: Build Or Revise Handling Method
Modernization
Union Bag Uses
ELECTRIC TRUCKS
Interplant Shipping
NEW UNIT OF HANDLING EQUIPMENT SAVED COST OF NEW BUILDING
How General Electric Handles Cable
The Key to Handling
Pre-Planning Economies
Centralized Management of Materials Handling
Tough to Move? Fork Trucks Are Our Answer
MATERIALS HANDLING— A Function of Traffic
10 Ideas for Anybody's Handling



*Kindly request your personal copy on your business letter head.

AUTOMATIC TRANSPORTATION COMPANY
Div. of the Y. & T. Mfg. Co.
117 W. 87th Street — Chicago, Illinois

"Ship ON PALLETS" . . Save TIME . . Aid LABOR
CUT COSTS WITH *New* "AUTOMATICS"

Here's one way to increase profits this year

CHECK UP ON WAYS TO SAVE IN YOUR OFFICE

Savings made by conserving time and effort in office work are an easy and immediate source of additional profits.

To help you effect such savings this year, Burroughs offers definite and practical suggestions for locating and eliminating useless, costly operations that handicap employees in the efficient and economical handling of office records.

The local Burroughs office will be glad to furnish you complete information about the very latest ideas and developments for making office savings—and to aid you in determining how you can avail yourself of them most profitably.

GET YOUR FREE COPY TODAY!

This new Burroughs booklet, "Ways to Save Time in an Office," suggests how certain operations, including those mentioned in the check-list at the right, might be shortened or eliminated to get the work done in less time, with less effort, and at less cost. For your free copy, write on your own letterhead to—

BURROUGHS ADDING MACHINE COMPANY
6158 SECOND BOULEVARD • DETROIT, MICHIGAN

- ☐ **Are all the reports produced in your office actually used?**
- ☐ **Do you type and compute an invoice in separate operations—or do you use the new equipment that does both jobs in one operation?**
- ☐ **Is your office organized to handle "preferred attention" items without disturbing the normal flow of work?**
- ☐ **Are you able to complete accounting jobs the same day they are started, or does your present system pile up figures for a month-end peak?**
- ☐ **Have you ever studied at one time all forms in use in your office to check for duplications, reference value, sequence of information, and posting procedure?**
- ☐ **Do you save time by using tables of interest factors, decimal equivalents, etc., in calculation work?**
- ☐ **Do the machines used in your office have the recent advancements that eliminate mental calculations, extra copying, rehandling of figures, etc.?**
- ☐ **Are your accounting records maintained in such a manner that statistics are available quickly, without separate analysis?**
- ☐ **Are there periods of inactivity on certain desks due to clogging of work at other points?**
- ☐ **Have you investigated recent developments for preparing in one operation related records that are now being prepared separately?**
- ☐ **Are office employees obliged to find their work in different places, or does the work flow to each desk in a normal, orderly process?**

Burroughs

"Letters and Comments"

(*Continued from page 7*)

Government Control of Insurance

Editor, MANUFACTURERS RECORD:

The indicated proposal by one of the governmental commissions or bureaus to transfer supervision of the insurance business from state to federal regulation and the obvious objectives that will ultimately follow are indeed a matter of vital concern to all of us, but especially to the 64,000,000 policy owners as well as beneficiaries under policies held, who in contemplation of such a change envisage the savings they have made sacrifices to accumulate, guaranteeing their independence through insurance, impaired and possibly wiped out. The even greater loss of that free and independent American spirit manifested in incentive, self-dependence and obligation to family would be inevitable should this dangerous proposal become effective.

It is inconceivable that 64,000,000 policy owners when they come to a full realization of the threat against their safety and independence will sit supinely by and permit such utter disregard of their rights and freedom. Therefore, it behooves all of us who recognize the danger in this latest move to be alive to the situation, seeing that these policy owners are correctly informed so that they will arise in righteous indignation and prevent the fulfillment of such a plan.

BRADFORD H. WALKER, President,
The Life Insurance Company of Virginia,
Richmond, Virginia

Is it a Crime to Have a Dollar?

Dear Dr. Wicker:

As a stranger may I offer congratulations upon your recent address under the caption "Is it a Crime to Have a Dollar?" I have not in a long time seen anything in such rich and vigorous language on such a pressing subject and am glad indeed to know that the Fork Union Military Academy has as its leader and director so able and good a man. I have ordered and received two hundred extra copies for distribution to my friends, North and South; also two of my local friends have just sent an order for a substantial number. I am writing the *Readers' Digest* suggesting to that publication further use in their columns.

ROBERT MCDOUGAL,
Dunedin, Pinellas County, Fla.

Dear Dr. Wicker:

Saw your "A Crime to Have a Dollar?" in the Charlotte, N. C., *Observer* of this week's issue, lost the date but have written for several additional copies. Article said it appeared in the MANUFACTURERS RECORD.

That is "hot" stuff but only too true. Wish millions could read it.

If any copies around would like a few. Congratulations on this excellent article and more power to you.

ELMORE D. HEINS,
National Theatre Corp., Roanoke, Va.

Dear Dr. Wicker:

My attention has been called to an article that you contributed to the MANUFACTURERS RECORD in Baltimore which was published recently. I understand this article is very timely and typical of the present conditions in this country at this time, and if you have a printed copy of this article I shall be glad to have you send it to me as I should like very much to read it.

W. A. HUNT, Chairman of the Board
Citizens Bank & Trust Co., Henderson, N. C.

The article, "Is it a Crime to Have a Dollar?" by Dr. John J. Wicker appeared in the August 1938 *issue of the* MANUFACTURERS RECORD. *Reprints are available at* $1.50 *per hundred,* $10 *per thousand.*

--Group Insurance--

The New Model

Provides Protection

To Employees in case of death, sickness, accident and retirement.

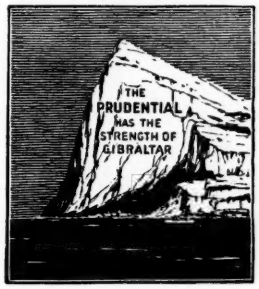
To Employees **and their dependents** in case of hospitalization and surgical expense.

Many employers are assisting their employees to enjoy the benefits of a comprehensive group program which

COSTS LITTLE BUT MEANS MUCH

in friendly cooperation

Employers' inquiries are invited



The Prudential
Insurance Company of America
Home Office, NEWARK, N. J.

100% VALUE ON A 2% ITEM

ELECTRIC POWER is a small item in industrial manufacturing costs.

In the general run of motorized production plants, (excluding electrolytic processes and the like) 2% is a common figure.

Small . . . but important! And we look to both ends of that statement. Industries know it; can build plans on it; can profit by it.

Favorable industrial power rates are characteristic of the Companies in the Commonwealth & Southern system . . . design to make power a small item in industrial costs and to stimulate adaption to new processes and expanded use.

Small in price . . . but important in action! That second phrase is vital too. Power at any price is no bargain unless the "recipe" is right. We aim to produce power and deliver it under the right conditions for your operating needs . . . and "live with" your service before and after.

That means a working interest in utilization, in your getting the most out of light, heat and power —and in rendering engineering assistance in all matters having to do with those elements. Experience and reliability are in our "recipe."

THAT'S OUR JOB—and our Companies are on the job for the customers and communities we serve.

THE COMPANIES in this system maintain for the benefit of their customers a personnel of experienced power, heating and lighting engineers . . . for cooperation in all matters looking to improving customers' operations through use of the companies' services.

THE COMMONWEALTH & SOUTHERN CORPORATION

ALABAMA - FLORIDA - GEORGIA - ILLINOIS - INDIANA - MICHIGAN - MISSISSIPPI - OHIO - PENNSYLVANIA - SO. CAROLINA

MAIL

The Wood Preserving Corporation, Koppers Building, Pittsburgh, Pa.
Please send me the following product information:

- ☐ How to Measure the Quality of Pressure Treatment
- ☐ Typical Highway Bridges of Pressure-treated Timber
- ☐ Pressure-treated Timber booklet
- ☐ Prevention of Termite Damage in Buildings
- ☐ Painting of Creosoted Wood

Your Name.....

Title.....

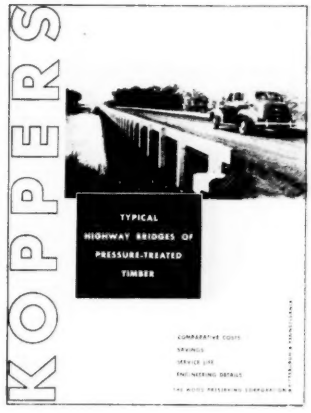
Company.....

Address.....

THIS CARD FOR YOUR COPIES OF FREE PRODUCT INFORMATION

This folder tells:

Why proper penetration with preservatives determines the life of pressure-treated timber.
How to be sure you get the proper penetration.
Approved methods of testing penetration of preservatives into poles, piling, timber.
Differences in penetration requirements of various types of wood.

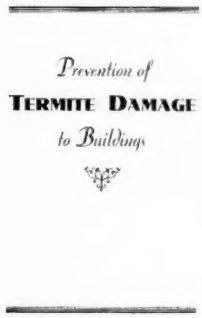


This folder tells:

Valuable lessons in economy of bridge building obtained in a study of pressure-treated bridges.
Bills of materials for different types of bridges.
Engineering details, etc.
Use the coupon to send for your copy. Free.

This folder tells:

What timber members need pressure-treatment in various types of construction.
What types of wood are best for various uses.
How timber is pre-fabricated before pressure treatment.
Use the coupon to send for your copy. Free.



This folder tells:

How termites cause their damage.
Methods of preventing termite attack in new buildings.
Dependable methods of eradicating termites in existing buildings.
Types of pressure-treated timber to use in various parts of construction work which may be exposed to termites.

This folder tells:

Results of tests made with 100 different mixtures and combinations of paint over creosoted wood.
Paints which serve best over creosoted wood.
Directions for painting creosoted wood.
Use the coupon to send for your copy. Free.

OTHER USES FOR PRESSURE-TREATED TIMBER:

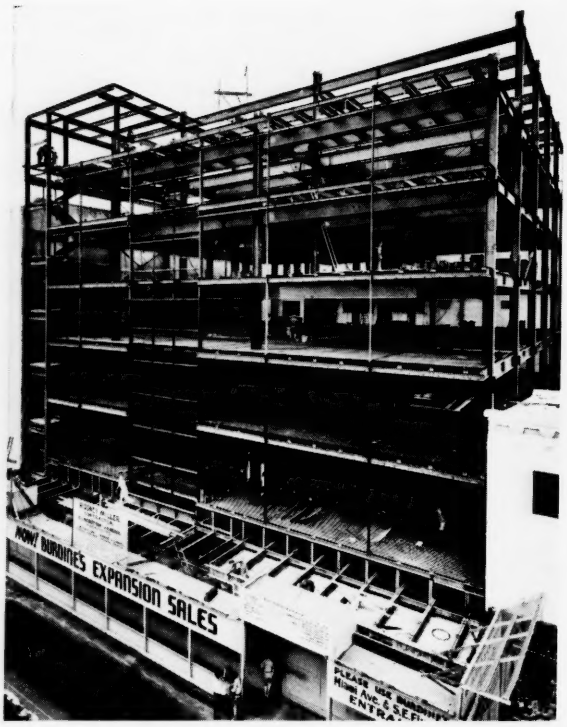
Piling . . . Wharves . . . Ties . . . Tanks, Sumps, Vats . . . Barges . . . Conduits . . . Cribbing . . . Culverts . . . Flumes . . . Poles . . . Trench Lining and Covers . . . Fences . . . Buildings, Bins, Sheds . . . Guard Rail Posts . . . Mine Timbers

OTHER KOPPERS PRODUCTS:

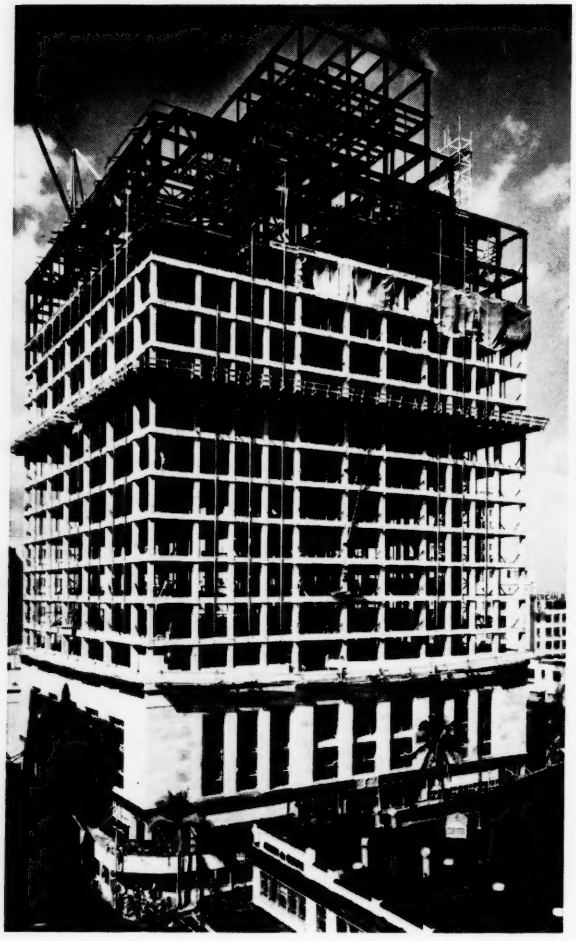
Roofing . . . Waterproofing . . . Bituminous Paints . . . American Hammered Piston Rings . . . Fast's Self-aligning Couplings . . . Platework . . . Castings . . . Tarmac Road Materials . . . Coal . . . Coke . . . Disinfectants

THE WOOD PRESERVING CORPORATION · PITTSBURGH, PA.

a KOPPERS subsidiary



Above: Burdine Building, Miami, Florida; E. L. Robertson, Miami, Architect; L. B. Taylor, Miami, Structural Engineer; Rodney Miller, Miami, General Contractor.



Right: Alfred I. duPont Building, Miami. Marsh and Saxelbye, Jacksonville, Archts. George A. Fuller Co., New York, Gen'l. Contrs.

More Miami Skyline

Virginia Bridge

STEEL STRUCTURES

And it's Steel, as it generally is when we start skyward. Because Steel is the strongest and most adaptable of all building materials.

Its use carries definite assurance against time and the elements.

VIRGINIA BRIDGE COMPANY

Roanoke Birmingham Memphis

Atlanta New York Dallas

"A FINE TIME FOR THAT TO HAPPEN... *but Scully can help us out!*"

"An order for one bar of alloy was 'phoned Saturday after closing hours. A truck was broken down on the highway. By special handling the bar was ready for the customer within 10 minutes after his messenger arrived at our Newark warehouse."

WE don't keep our warehouses open day and night—but you can always get a Scully man on the phone at the office or at home. When emergencies occur we do everything within our power to meet the situation promptly and efficiently.

However, it's regular orders, not emergency orders, that make up the bulk of our business. What about them? Does Scully Service function as well as with rush orders? We'd be glad to have you ask any of our thousands of customers. Scully Service is built upon the principle that our customers *always* want immediate shipment and friendly contacts. No matter how large or how small your order may be, it will get the same treatment. Each of our eight conveniently located warehouses operates on this principle—and we always hurry, whether you ask us or not.

If you're not one of our customers now, why not call Scully the next time you need steel, steel products, copper or brass? And ask for a free copy of our 1940 Stock List and Reference Book.

The Mark of Quality USS Scully Service *The Mark of Service*

SCULLY STEEL PRODUCTS COMPANY

Distributors of Steel, Steel Products, Copper and Brass

Warehouses at CHICAGO · NEWARK, N. J. · ST. LOUIS · BOSTON
ST. PAUL-MINNEAPOLIS · CLEVELAND · PITTSBURGH · BALTIMORE

UNITED STATES STEEL

The Industrial South

Maryland

Maryland was among the first of the Colonies to embody the qualities that grew into American ideals of tolerance and liberalism. Since 1634 when King Charles I granted a royal charter to Lord Baltimore, men here have found liberty in thought and action.

Much of our country's history has been made in the Old Line State. The national anthem was inspired by and written during the bombardment of Fort McHenry in 1814. The house where Mary Pickersgill wove the bunting for the Star-Spangled Banner still stands in Baltimore for all the world to see. Maryland has preserved her landmarks, her history, traditions and institutions so generations to come may know her glorious past.

Did you know?

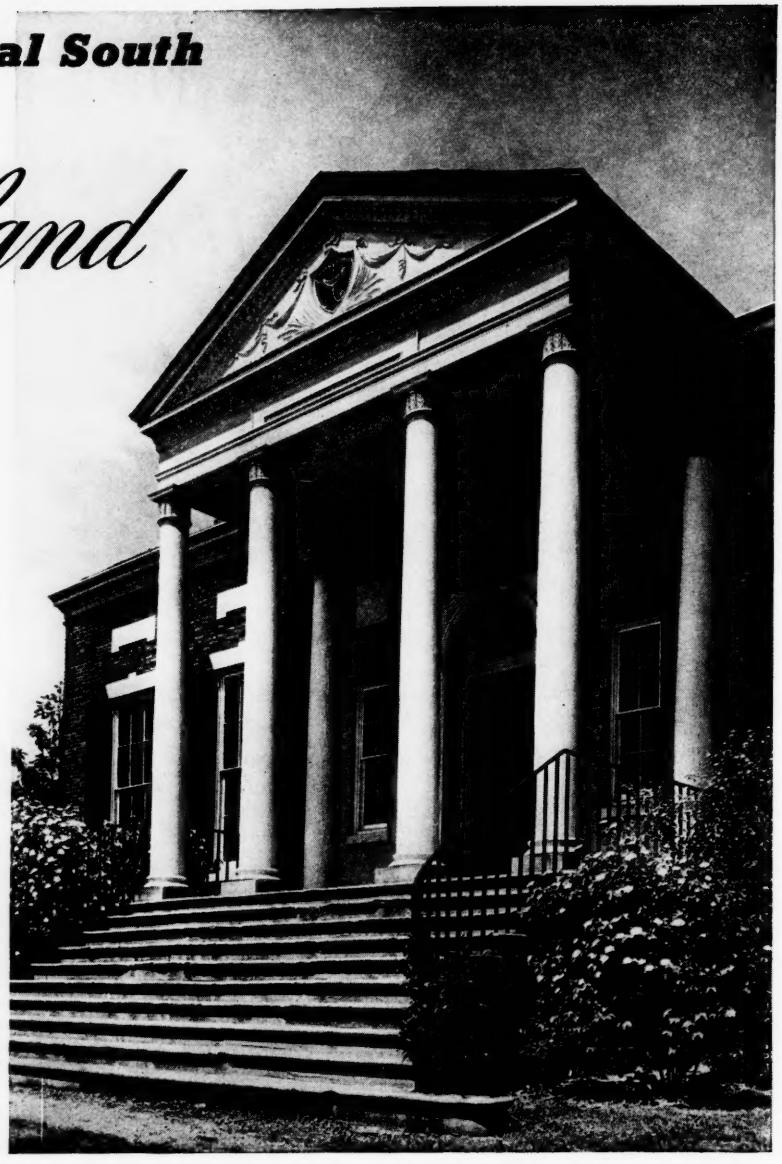
That—Cecil Calvert never visited the Maryland colony of which he was the true founder.

That—America's first railroad station is still standing in Baltimore. Built in 1830, the Mount Claire Station received the world's first telegraph message, "What hath God wrought."

That—The town clock in the tower of Trinity Chapel in Frederick, Maryland has been in continuous service since 1796.

That—Bancroft Hall at the Naval Academy in Annapolis, Maryland, is the world's largest single dormitory.

That—Maryland's fishing industry centering in Chesapeake Bay produces an annual catch valued at more than $2,000,000.



The Homewood House standing on the campus of the Johns Hopkins University in Baltimore. This fine example of Georgian Architecture was the wedding gift of Charles Carroll of Carrollton to his son in 1801.

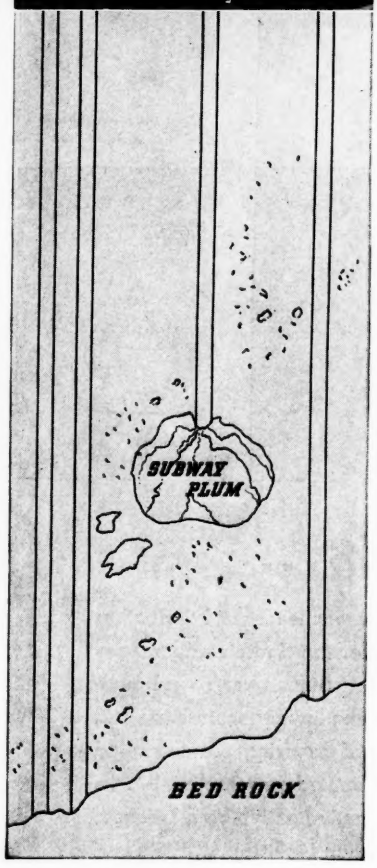
The edge of Maryland's charm, history and tradition has not been dulled by her industrial advances. Hand in hand they live together, each respecting the other's importance, each conforming to the other's individuality. Maryland is, so to speak, America in miniature.

Industries today in Maryland cover many fields. Important among them is steel, with Bethlehem's Maryland Plant, at Sparrows Point, a prime factor in this activity. This country's only major steel producer to be located on tidewater, Bethlehem's Maryland Plant is strategically situated and equipped to supply Maryland and the entire industrial South with the manifold steel products essential to modern progress.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

HOW TO PENETRATE A "Subway Plum"



Toughest foundation jobs made possible with National Steel Pipe Piles

OUT of New York City's West Side express highway emerges a fact of greatest importance to the construction industry: NATIONAL Steel Pipe Piles can penetrate to solid footing through the most difficult known types of sub-surface conditions.

Among the toughest obstructions met by engineers on this project were "Subway Plums," large irregular rocks imbedded in mud. Such a rock can completely stop a pile. Open-end NATIONAL Pipe Piles were used in locations where old rock fill had been placed. If the depth at refusal indicated a subway plum, the rock was rammed with a length of 8- to 10-inch shafting, or chipped with a pointed 110-pound rail, and the pieces blown out with a high-pressure air jet.

In some cases drill holes were sunk through each of the subway plums and shot with dynamite every 5 feet as the casing was pulled. After this treatment the pipe piles went to bed rock at 4 or 5 blows to the foot. Contractors on earlier sections had rejected the idea of drilling and blasting as likely to damage the piles. But NATIONAL Pipe Piles withstood this severe treatment without failure.

No matter what foundation conditions face you, the New York West Side express highway job proves that NATIONAL Steel Pipe Piles can satisfy practically all requirements. Here is a foundation that penetrates where other pilings fail, has greater supporting strength, costs less for deep and difficult penetration, and can be inspected full length after driving. No other type of foundation offers you all these advantages.

Send for Bulletin No. 27—NATIONAL Steel Pipe for Piling.

NATIONAL TUBE COMPANY

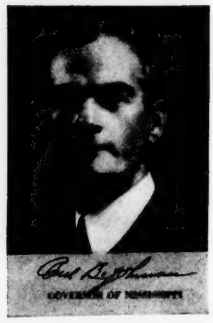
PITTSBURGH, PA.

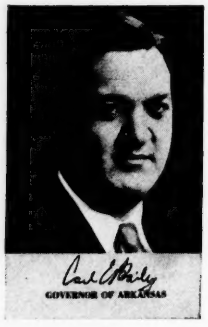
Columbia Steel Company, San Francisco, *Pacific Coast Distributors* • United States Steel Export Company, New York

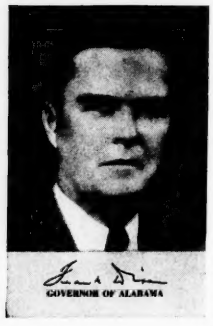
UNITED STATES STEEL

PROSPERITY BALANCE

A 10-YEAR PROGRAM OF SOUND DEVELOPMENT OF THE SOUTH







WE, THE GOVERNORS...

Of the Southern States are convinced that our section, to enjoy its vast natural advantages for the location of industries, must have a balanced economy. Therefore, we have launched and are pushing vigorously a 10-year program of "prosperity balance," seeking to balance farms with factories, crops with livestock and economic gains with human welfare advancement.

With the removal of unfair freight rates by the Interstate Commerce Commission, the last artificial barrier to the South's industrial progress was lifted. Business leaders of the nation are urged to consider the South's advantages for location of their plants: a year-'round moderate climate, affording lower construction and production costs and assuring uninterrupted operations . . . Unlimited raw materials . . . Friendly and cooperative native-born labor . . . Excellent transportation facilities . . . Ports and shipping facilities strategically located to serve the rapidly growing trade with South and Central America.

Southern Governors Conference

Bona Allen Building, Atlanta, Georgia

LAWRENCE WOOD ROBERT, JR., Executive Director — **CARROLL DOWNES**, Industrial Consultant

LOOKS LIKE METAL: ACTS LIKE METAL: IS METAL

The word Aluminum on a can of paint is no figure of speech.

The Aluminum in Aluminum paint *is* Aluminum.

Flakes of honest metal, pounded very thin, indeed, and each with some of the same characteristics as a sheet of Aluminum big enough to roof a railroad car.

Each flake is polished in the making. Hence the high reflecting power of Aluminum paint.

Each flake is opaque. That's why Aluminum paint hides so well.

Each flake has the resistance-to-corrosion which Nature gave to Aluminum.

Take enough of such well made flakes (such as Alcoa Albron Paste or Powder) put them into the right vehicle for the job at hand, and you've got a paint that has properties no other paint can boast.

Even if you never use *any* paint *anywhere* (we never heard of such a person), this advertisement will help you remember Reflectivity and Resistance to Corrosion, those two choice attributes of Aluminum.

Another moneysaving way to take advantage of Reflectivity is to use lighting reflectors made by leading manufacturers from Alzak Reflector Lighting Sheet, which is Alcoa Aluminum specially surfaced to give both high reflectivity and long life.

Every time you use any piece of Alcoa Aluminum you profit by Aluminum's natural Resistance to Corrosion. And that goes for the strong Alloys of Alcoa Aluminum, the weight savers of industry.

Aluminum Company of America, 2109 Gulf Building, Pittsburgh, Pennsylvania.

Reg. U. S. Pat. Off.
ALCOA
ALUMINUM

ALCOA · ALUMINUM

AKLO SPEEDS PRODUCTION

in this modern aeroplane plant

● Out of this modern Curtiss-Wright plant go the pride of American Aviation—those sleek fighters that are the envy of every Air Corps in the world. In the windows of this modern plant is Blue Ridge AKLO Industrial Glass—and it is there for a definite purpose, to reduce Glare, reduce solar Heat, speed Production.

There is hardly a plant in existence today that could not profitably employ AKLO Glass for one reason or another. In one plant it may be used to reduce cooling loads—in another, to prevent spoilage of perishable goods from solar heat—still another case, you'll find increased worker efficiency because Glare and its attributable eyestrain have been reduced.

● Blue Ridge AKLO Glass is a blue-green, low expansion Figured and Wire Glass that absorbs practically all of the infra-red (heat) rays of the sun, substantially reduces glare, and at the same time admits adequate daylight.

You can prove the value of AKLO Glass in your own plant—pick out the toughest window spot you can find, then put it up to your L·O·F Representative or Glass Distributor to prove the value of AKLO. You can also see the AKLO story in Sweet's Architectural and Engineering Catalogs. We'll rest our case on your findings. Blue Ridge Sales Division, Libbey·Owens·Ford Glass Company, Toledo, Ohio.

● Interior Kenmore, N.Y., plant of the Curtiss Aeroplane Divison, Curtiss-Wright Corporation. Albert Kahn, Inc., Architects. A. D. Palmer, Jr., says—"Aklo Glass has been helpful to working conditions, in that it is truly a non-glare glass. This has been found especially true in the assembly building, where aeroplanes with shiny Alclad surfaces are being constructed. With normal glass and a bright sun condition, work on certain parts of the plane, where reflection was especially pronounced, would be impossible."

BLUE RIDGE AKLO GLASS

HEAT ABSORBING · GLARE REDUCING · THERMAL SHOCK RESISTING
FIGURED AND WIRE GLASS

THE SOUTH SCORES AGAIN

Elsewhere in this issue is an article entitled "Rayonier Makes Eastern Debut." To the uninitiated this may mean very little, but to those who are informed the modesty of the title will appear as an understatement in spite of its accuracy.

During the last several years we have become somewhat accustomed to announcements concerning the establishment of huge, new plants in the South where agricultural and mineral products are converted into literally thousands of commodities for everyday use.

Among the largest plants recently erected in the South have been those for the manufacture of rayon and pulp and paper. The latter in particular have been much in the public eye since the success of Dr. Charles H. Herty's pioneer work with the pulping of Southern pine.

The manufacture of Kraft, all kinds of white papers, liner and other boards, and a host of other articles have become commonplace. Last fall it was announced that cigarette paper is now being made in the South on a large commercial scale for the first time in this country. Then last month the South's first mill for making newsprint from Southern pine started production at Lufkin, Texas.

Now comes the opening of another mill, that of the Rayonier Corporation at Fernandina, Florida. The title referred to gives little or no indication of the fact that this mill represents a great accomplishment and is the culmination of years of research, for this will be the first time that commercial rayon pulp has ever been produced from Southern pine by means of the sulphite process.

Thus, another step has been taken that more closely binds the rayon and pulp industries together and gives practical evidence of the importance of a Southern resource as a major source of supply.

The extent to which the rayon industry has grown in the South may be gauged from the fact that capitalization of the existing fourteen Southern plants is estimated in excess of $150,000,000. As employers of labor this industry also occupies an important place for there are nearly 50,000 people employed while the annual capacity of these plants amounts to nearly 400,000,000 pounds of rayon yarn.

If the value of production of the pulp and paper industry, where the present capital investment exceeds $200,000,000 exclusive of forest land, are added to those of the rayon industry it will be found that the total annual value of the products of these two industries is equal to almost one third of the value of all the South's manufactured products in 1900.

Law Without Justice

The investigation by a Committee of the House of the way the Labor Relations Board has been administering the Wagner Act has filled columns in the daily press. It is still in progress as this is written.

The hearings concededly have been conducted judicially and fairly. While its work is not finished, testimony so far in a number of instances has developed evidence of shocking procedure on the part of the Board's trial examiners. They are shocking to the American sense of justice and are a reflection upon the administrative competence of the Board.

It was adduced that one field attorney had rewritten a report and "gone as strong as I can for the union" when he reached a decision on CIO charges against a Wisconsin firm. Another helped to present CIO charges against an employer and reviews the case as a board regional director, and finally reviewed the litigation in his present capacity as chief trial examiner. Another regional attorney was transferred to the review division in Washington, though described by his chief as "absolutely inexperienced" and "insulting" in the court room. This individual admitted impropriety, ascribing it to over-zealousness and the belief his job was that of a prosecutor determined to convict. Numerous similar instances have developed in the testimony of lawyer acting as investigator, prosecutor and judge.

The purpose of the National Labor Relations Act, its preamble states, is "to reduce the causes of labor disputes" and yet there is no word in it that admits of the possibility of wrong-doing on the part of an employe. Whatever may be the shortcomings of the Labor Relations Board; whatever may be the mishandling of cases brought before it; however the final findings of the Committee may view the necessity for changing the makeup of the Board, an outstanding fact is the Wagner Act as a piece of lopsided legislation is glaringly at fault.

The more that evidence is brought before the Committee, it becomes crystal clear that as an instrument for producing harmony it is a failure. It can produce nothing but discord and dissatisfaction. Probably no bill adopted in recent years in the so-called reform class—and goodness knows there have been eonugh of them—has caused as much upset to business, so much loss of confidence in government intentions toward business, as the Wagner Labor Relations Act. Its cost has been vast in money wasted and time lost by employers the country over in trying to meet the requirements of its unfairness.

The important task before Congress is to at once change the Labor Relations Act and limit the authority of a government agency which is employing large numbers of lawyers to work for it of an average age under 30 years, and an average experience in legal practice of less than a year, with some so prejudiced in favor of a particular union that they could see no other side to the case.

There are too many Boards and Bureaus of a quasi-judicial nature with unlimited and unchecked power for the wellbeing of the country. This power must be limited else the sanctity of our courts as interpreters and administrators of the law of the land will be destroyed.

Over one of the entrances of the Department of Justice the statement appears—"Where Law Ends, Tyranny Begins." Has not tyranny already gotten under way?

States Rights

The Southern Governors' Conference in session at Nashville last month went on record against interstate trade barriers, encouragement of agricultural and industrial development and parity in freight rates.

While no official action was taken, the most vital matter discussed, in the view of the MANUFACTURERS RECORD, was that of states' rights. It would not down, but kept coming up at the various sessions. Governors Bailey of Arkansas, Stark of Missouri, and Phillips of Oklahoma, were among those who made notable addresses calling attention to the dangers inherent in the abandonment by states of their constitutional right of self government.

A fact disregarded by the authorities of the New Deal is that this government is founded upon the maintenance of the rights of the separate states. The encroachment upon these rights by centralized power at Washington has reached such alarming proportions that even those who have been in favor of Federal grants for various purposes, grants which were never intended as functions of the Federal government, are now alarmed when they face the possibility not only of being unable to pay the part that state or local governments are expected to pay, but in accepting Federal regulation of affairs heretofore wholly within the control of the state.

Governor Bailey, recognizing the increasing tendency of the Federal government to control, said: "This type of change in the Federal policy brings not only the leadership, but the people themselves face to face for the making of a momentous decision. That decision is, shall the form of American government be changed so as to give centralized power and control to the Federal government?"

Governor Stark of Missouri, rightly pointed out: "The doctrine of states' rights in this day and time will be an actuality only in proportion to our abil-

ity to make the states effective economic units through which we perform the essential tasks of democratic government."

The Nashville *Banner* editorially says: "Under the lure of gifts from the Federal Treasury, either absolute or conditional, the states in recent years have been surrendering rights in order to be relieved of their responsibilities. Such a process of abridgment of the authority of the states and expansion of that of the Federal Government is accomplishing and fortifying the centralization of power at Washington and reducing the states, in no small and an ever-increasing degree, to the estate of vassal provinces."

There has been apparently a purposeful disregard of the province of the Federal Government founded by the fathers. We have been told we live in a changing world, and that the Constitution has been outmoded. We have been lulled by such phrases as "no one in America shall starve," until men look to Washington and are becoming accustomed to look for a living without work. We have gone a long way from old moorings and since the time when Grover Cleveland refused to sign a bill to pay $25,000 to drought sufferers in Texas, saying: "I can find no authority in the Constitution of the United States to pay over taxpayers' money for such a purpose." The money spent has not accomplished its purpose. Millions are still unemployed.

It is a heartening sign that the Governors of important Southern states — where so many opportunities abound for new wealth creation, where frontiers are developing rapidly for the profitable investment of capital — are outspoken in their recognition of the fact that the separate states are best able to handle their own affairs, their own economies, their own problems, as they always have done. And it may be added that during that time examples of starving Americans have been noticeable by their absence.

Has the South sold its birthright for a mess of political pottage?

Opportunity

In covering the industrial news of the South for more than half a century as the MANUFACTURERS RECORD has been doing, it has become quite a usual thing to receive in each day's mail from readers in various states and from other countries, inquiries about many things. Manufacturers eager to learn the extent of the Southern market are keenly concerned about labor conditions, water supply, tax laws and educational facilities in different localities. New industries in the South use our service regularly to obtain information about where machines and equipment in wide variety are manufactured. Sometimes we get stuck, as when we are asked how many shingle roofs there are in the South, but throughout the years there has been assembled a mass of data from which in most cases we are able to provide the needed facts.

This spring there will be published from this office "The South's Resources" which will be made a comprehensive and up-to-date volume of facts covering the natural wealth possessed by the sixteen Southern states.

The Blue Book of Southern Progress which we issue here has long been the recognized authority upon the South's progress from year to year. It provides its readers with data about what has been accomplished in Southern development and new wealth creation.

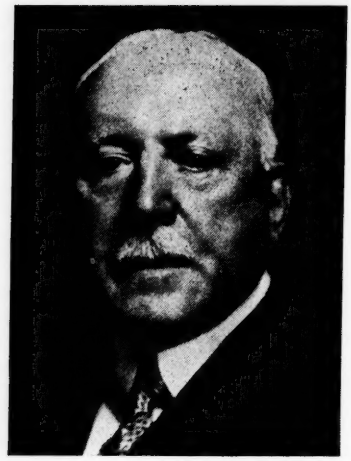
"The South's Resources" however will contain in text matter and in colored industrial maps of each state the facts about the natural resources that are available and are being commercially utilized or are awaiting development. Transportation facilities—rail, water and air—prevailing temperatures and rain fall, etc., are shown on the maps and explained in greater detail by text matter which deals with taxation, labor supply, power and other pertinent material such as manufactured output, agricultural income by crops, population figures, density per square mile, etc.

In an announcement made in these columns last month it was stated that shortly there would be available a prospectus giving further details of the intended publication. This met with requests from all over the country indicating definitely there is more interest in Southern opportunities today on the part of investors and manufacturers than there has been for a long time, if ever in the past. Instead of the South being a section constituting a problem for the nation, it is a frontier for business accomplishment.

We have traveled a difficult road in this country for a number of years—a road that led us into overwhelming debt and one which could not possibly tempt practical business men to venture on it because it minimized private endeavor and glorified reform efforts which were so vague and costly that they accomplished little. The tide is generally turning away from that road and the sentiment of the solid people of the country is more pronounced for recovery as the only means by which the idle will be employed and private enterprise move forward. Theorists are not so popular now.

The fuller development of our natural resources will provide a future that will exceed in prosperity and well-being anything of the past. It is our purpose in the volume proposed to present in crystallized form the opportunity for which America waits. The furtherance of the development of the nation's greatest asset will mean the greatest enrichment of the whole country. That is the invitation the South extends to private capital.

CHANGING ECONOMIC BOUNDARIES



BY

James A. Farrell

Chairman, National Foreign Trade Council

WE enter upon another year of accumulating trade disabilities in the foreign field. This present war imposes limitations on freedom of American shipping and commerce more drastic than ever before in our history. The restrictions applied by our Neutrality Act, and unnecessary hindrances to our oversea trade, require to be carefully reviewed by the Congress. In modern wars the economic weapon as a determining factor has attained a place in military strategy which tends to bring about unnecessarily rigid trade restrictions. The London Chamber of Commerce, for example, expressing the general attitude of the industrial and commercial world toward measures of Government control—urges upon the British Government that such controls in wartime should be imposed only where it can be shown that the object to be attained cannot be achieved in a less disturbing way. Unnecessary disruption of existing manufacturing and distributing systems is a hindrance to a supreme objective which all countries must keep in view at the present time: the necessity of strengthening a country's powers of resistance to the economic repercussions of the war.

Another thought to bear in mind is the necessity of maintaining so far as possible democratic methods of trade control, by close cooperation between government and business. Much confusion was caused in American foreign trade departments by restrictions under the new Neutrality Act which at the beginning were far from being explicit. That situation has been clarified, and there remains only the need for further careful examination of the Act by the Congress, in the light of any amendments found necessary in the interests of American shipping and oversea trade. Reason, not emotion, should guide us in planning measures designed to safeguard the nation's welfare. Until the doctrine of the freedom of the seas is respected by nations at war, the United States would be ill-advised in proclaiming to the world abandonment of its natural rights, through pressure of groundless fears and false alarms. Our position should be that of Thomas Jefferson: That war among others shall be as if it did not exist.

On the eve of the present war the economic boundaries of the world already had undergone changes that restricted our freedom of trade in Europe. Austria and Czechoslovakia had been absorbed by Germany; Poland by Germany and Soviet Russia. Since the outbreak of the present war, a number of the Baltic and Balkan States have been forcibly included in the spheres of influence of Russia and Germany. What the future holds in store for these dispossessed nations depends on the outcome of the war on the Western front and on the next Peace Treaty. In the Far East, the open door has been closed in China. Wherever we turn, America finds a narrowing field of commercial enterprise.

Attention has been drawn to the fact that our Neutrality Act, by means of the cash-and-carry restrictions on our trade with the belligerents, has converted our trade with our best customers from a selling to a buying maket. What effect this may have on our future trade with Europe is a matter of conjecture. It is evident, however, that trade and shipping connections are not strengthened by any prolonged interruption of the personal contact between buyer and seller or of the freedom of American shipping to maintain its contacts with foreign ports. Wartime trade being in the hands of foreign government agencies, the purchase of American goods during the war not only changes the technique of the American exporter, but hampers considerably his efforts to maintain his normal trade connections. Censorship of American mails by the belligerent nations, credit restrictions, and the necessity for reducing imports into belligerent countries to meet essential needs only, will not conduce to enlargment of our wartime trade beyond the bare necessities required by the belligerents and the neutral countries that lie strategically within their spheres of influence. Offensive and defensive economic fronts which have been organized by the respective belligerents in Europe will naturally be reflected in the diversion of trade by the belligerents to countries that are tied in with their military strategy. We already have evidence of this in the British curtailment of imports of American tobacco and cotton and purchases of these from Turkey and other countries. The effect of the Johnson Act restrictions on credit in our trade with Great Britain and France, also is a factor in the situation which must be taken into account. British and French trade within their respective empires is another element in the situation which has the tendency to limit American opportunity in those areas. The British dominions naturally look to Great Britain for all the business which it is possible to place with them for both agricultural and industrial products. It is not unlikely that a greater diversion of British trade to the dominions will at the close of the war see the revival of the Ottawa preferential policy in its original exclusive form.

It should not be forgotten that the greater industrialization of all countries since the previous war places the United States at some disadvantage in European markets which have thereby become of increased strategical importance to the belligerents. Perhaps the most significant factor in the present wartime trade situation is the gradual disappearance of the system of international commerce carried on between individuals and the replacement of this by government-controlled trade relations. Under this system, foreign trade has ceased to be directed in accord with economic principles and practices and has become a mere instrument of political diplomacy.

Opposed to this trend towards totalitarianism are the views of the business world as expressed by the International Chamber of Commerce, the League of Nations and other international bodies, and the fact that twenty-one countries with whom the United States has trade agreements have subscribed to the principles and practices embodied in the Reciprocal Trade Agreements Act of the United States, designed to counteract the bilateral trade policies of the totalitarian nations. One of the great decisions which await the European Peace Conference after the war is the future of the totalitarian economic system.

The changes in world economic boundaries are not confined to those made by the removal of territorial landmarks. They strike deeper in the unbridged chasm created by the abandonment by totalitarian countries of the principles and mechanism of international trade. We have experienced during the past decade the aggressive methods of economic nationalism, reflected in bilateral compensatory barter agreements which have diverted trade into channels that obstruct freedom of multilateral trade transactions and thereby impede the expansion of the total of world trade. In any forecast relating to our future place in international trade, we must take account of the place occupied by totalitarian countries after the war. It is of minor importance whether the totalitarian government carries on trade directly, or, as in the case of Germany, by assistance to its nationals by various kinds of subsidies; in either case their exports constitute a menace in the form of dumping.

There are some in the Congress of the United States who, while condemning these totalitarian trading methods, demand that we adopt their uneconomic practices by farm export subsidies which, while maintaining a high domestic price for agricultural products, will enable the surplus to be sold abroad at the lower world price. Experience has shown that our raw cotton exports have rapidly declined in recent years, due to the efforts made to raise cotton prices above the world level. This plan has proved to be illusory. To attempt to overcome existing competition of foreign cotton growers by export subsidies is to wage a trade war and to court reprisals.

American business enterprise has been greatly curtailed by the barring of ninety American vessels from United Kingdom and North European ports. The war so far has been waged chiefly against mercantile shipping. While steps have been taken to sell a number of American ships to belligerents, and while this will dispose of considerable tonnage classified as obsolete, the fact remains that interruption of these services to European ports, which are our lines of communication with our oversea markets, must prove a serious handicap to our trade now and in the future. So late as 1914, 90 per cent of our foreign trade was carried in foreign vessels. Before the Neutrality Act (1939) barred our shipping from the war zones, 35 per cent of our foreign trade was carried in about 375 American ships, compared with only 19 American vessels engaged in foreign trade service in 1914. It is a simple matter to remove the American flag from vessels carrying our trade with Europe, but an extremely difficult matter to restore it after the emergency has ceased to exist.

JAMES A FARRELL

In discussing Changing Economic Boundaries, Mr. Farrell brings to the subject a wealth of experience.

From 1911 to 1927 Mr. Farrell was president of the U. S. Steel Corporation at which latter year he was elected its chief executive officer as well as president, holding both positions until 1932 when he retired from active participation though retaining his connection with the corporation as a member of its board of directors. In 1910 Mr. Farrell was appointed chairman of the committee on foreign relations of the American Iron & Steel Institute, a position he held until 1932.

He has always been interested in the sea, a heritage from his father, and was the owner of the TUSITALA, the last clipper ship engaged in active trade and now used by the U. S. Maritime Commission as a training ship.

Expectations of increased American trade through failure of belligerent countries to supply certain markets during the war, should not lead us to indulge in extravagant hopes which may not be realized. Recent British heavy purchases from the Argentine and Uruguay account in some measure for the failure of our trade negotiations with those countries. As a consequence, British agents continue to have a hold in those markets and British competition for former German trade must be reckoned with in any calculations as to "capture" of this trade by American firms. As an illustration of what is taking place, it is reported that the Reich has informed Argentina of its inability to complete the barter agreement of last March, by which it undertook to deliver railway material in exchange for wheat and wool of a total value of about $5,000,000. German firms also are unable to complete a contract with Uruguay for the Rio Negro hydro-electrification undertaking. Similar undertakings by German firms in Brazil have been cancelled.

While the elimination of German competition, through failure of the Reich to carry out its barter agreement undertakings with Latin American countries, has resulted in increased inquiries for United States goods, it would be unwise to assume that the "capture" of this trade by American firms is easy of accomplishment. The basic obstacle to high expectations of increased trade with Latin America lies in the fact that United States and Latin American export surpluses of primary commodities are alike for the most part.

The trade of Argentina, Uruguay, Peru and Chile, accordingly, flows to other countries, United States dollars not being available sufficiently for increased purchases of our American goods. Recent heavy purchases by Great Britain of Argentine and Uruguay foodstuffs account in some measure for the pressure brought upon these countries which led to the breakdown of the trade negotiations with the United States. Within the Empire, Britain has agreed to buy the entire wool clip of Australia and most of the wool clip of South Africa. Canada and New Zealand are supplying increased quantities of bacon, ham, fruit, etc.

Britain and France look increasingly to their export trade as a means of creating credits abroad for purchase of essential imports. Belligerent countries, however, are confronted with the difficulty not only of delivering the goods, but of having available the necessary raw materials and the margin of productive capacity required to meet outside demands.

The great problem before the United States is the character of international trade after this war. Our foreign trade policy has been devised with the object of counteracting the totalitarian trend towards bilateralization of trade. It seems to me most unwise at this stage to weaken American efforts in this direction by a reversal of our tariff-making policy, when it is so necessary to avoid unnecessary changes which would add to the difficulties created by the war. It should be our aim to consolidate our position in world trade and to postpone to the close of the war, review of our trade agreement policy in the light of conditions then prevailing.

NEW CARLOAD FREIGHT RATES

THE eyes of the shipping world were turned toward New Orleans and the Mississippi Valley the week-end of January 6th, when the first trainload of blackstrap molasses to be handled under the recent decision of the Interstate Commerce Commission moved out of the Southern seaport for Peoria, Illinois. The decision of the commission, which removed its previous carload limit on freight rates, authorized a mulitple car or quantity rate of 15 cents per hundred pounds in minimum lots of 1800 tons—38½ tank carloads—from New Orleans and Harvey, Louisiana, to Peoria and Pekin, Illinois.

In the pioneer movement forty tank carloads of molasses were handled by the Illinois Central System, shipped by and consigned to the Commercial Solvents Company, destination Peoria. During the month of January four more shipments were made under the new rate schedule.

The importance of this initial shipment is not in the train itself, but because of the possibilities opened to the railroads by the "Blackstrap Trainload Rate Case." The principle involved in establishing quantity rates on commodities which move in volume that are more favorable than the previously adamant carload basis of rate-making is the underlying reason for the great interest shown in this movement of molasses by the shipping world.

Possibilities of adapting the principle to other commodities have been suggested by numerous persons familiar with railway traffic and transportation in general. Consideration is being given to the practicability of moving sugar, petroleum and its products, coal, ore, grain and other bulk commodities under similar arrangement. However, the "blackstrap" case is so simple in comparison to the handling of other commodities that it is considered unlikely that any effect will be seen in handling other commodities for some time to come, according to F. H. Law, vice-president in charge of traffic of the Illinois Central System.

It was back in 1935 that the movement of blackstrap molasses attained importance. At that time importation on a large scale was undertaken for the manufacture of alcohol, solvents and allied products. In an effort to forestall impending movement by privately owned barges the Illinois Central established a transit arrangement with a net rate of 17½ cents. The receiver, by reason of this favorable rate, restricted an investment in transportation to a minimum of one towboat and four barges. This left a considerable part of the molasses to move by rail.

Subsequently the Interstate Commerce Commission, after an investigation, upset the 17½ cent rate and in 1937 authorized a 20 cent rate in a somewhat different form. The result of this decision was the doubling of its barge capacity by the private concern and the complete loss to the railroad of this business. A return to the 17½ cent rate authorized in 1938 was insufficiently low to attract the molasses movement to the railroads.

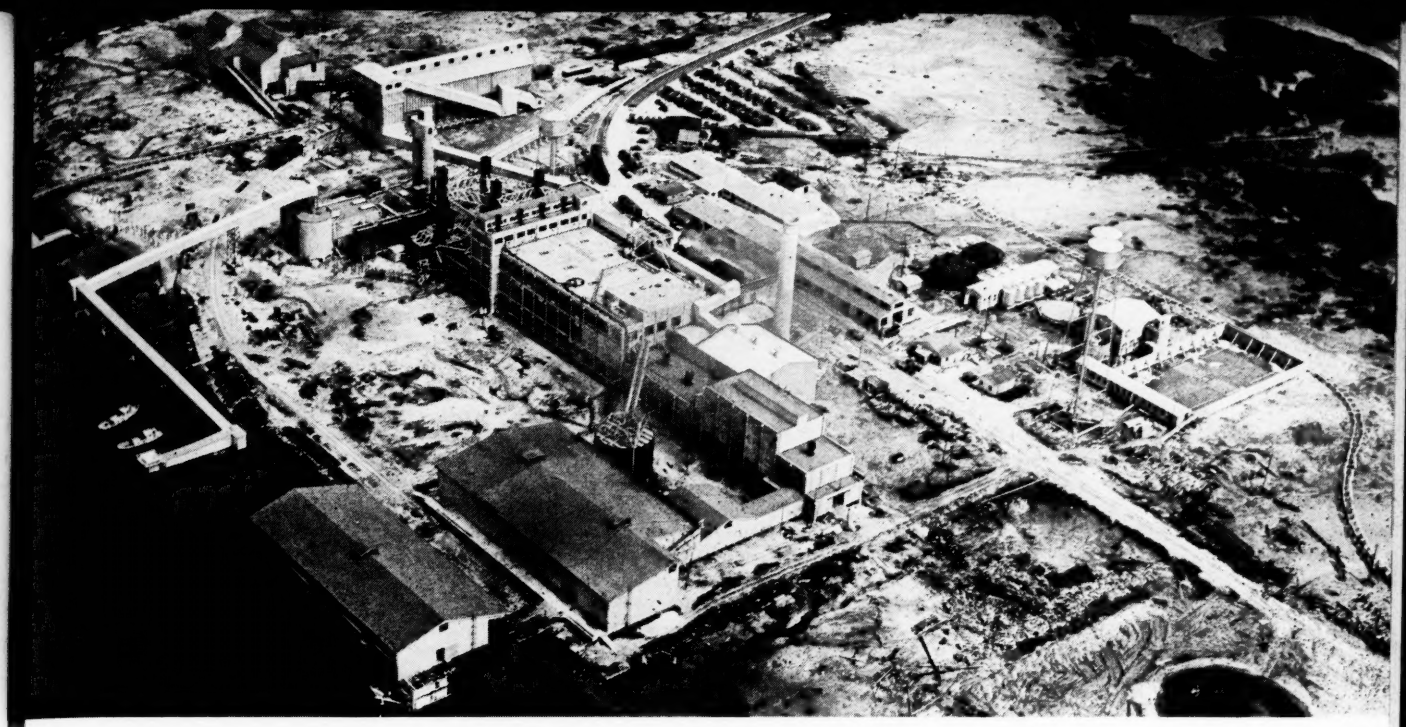
Working closely with the industry for the next year, railway men developed a mutually satisfactory plan which would return to the rails a major portion of the blackstrap movement. In June, 1939, the Illinois Central System published a rate of 14 cents per hundred pounds on a minimum shipment of 1800 tons. The Interstate Commerce Commission suspended the rate, held hearings, and last December upset all its precedents by deciding that "there is nothing unlawful in railroad rates based on quantities greater than carload, moving in single shipments, when such rates are designed to meet the competition of other modes of transport." The commission, however, prescribed a rate of 15 cents, instead of the 14 cent rate proposed by the railroad.

The term "trainload rate" infers that special trains are set up to handle this business. This is not true. The cars are handled in regularly scheduled freight trains just as are carload shipments. It was emphasized before the commission during the hearings that because of such handling the low quantity rate would be compensatory to the railroads.

In the background, of course, is subsidized inland waterway competition which has been devastating to the railroads of the Mississippi Valley. No other road has been so adversely affected as has the Illinois Central because of its geographic location. Not only have the common car-

(Continued on page 48)

The Illinois Central train carrying 1,800 tons of black-strap molasses in 39 tank cars as it arrived in the Nonconnah yards, Memphis, Tenn., en route for Peoria, Ill., from New Orleans and Harvey, La.



The new Rayonier mill at Fernandina, Florida

RAYONIER MAKES EASTERN DEBUT

ON May 10, 1927 a local paper in Shelton, Washington reported "New Mill Turns Out First Pulp—Nineteen tons of white and fleecy pulp was run through the plant of the Rainier Pulp & Paper Company on Monday morning, the first cook of hemlock chips to be turned out of the new mill and the first introduction of Shelton to the pulp-making world. The product was highly pleasing and according to the experienced operatives and officials in charge of the plant, is claimed to be of superior grade and quality and most desirable in the making of high-grade sulphite papers."

Less than ten years later, this company had expanded not only the Shelton plant to a capacity of approximately 300 tons daily, but had in the meantime acquired three additional mills in the State of Washington, in the Puget Sound district. In the latter part of 1937 the company was reorganized under the name of Rayonier Incorporated. In the short space of ten years this company rose from virtual obscurity to first position in the dissolving pulp field.

Some years ago, President Edward M. Mills, recognizing the necessity of keeping abreast of the rapid development of the rayon, cellophane and plastic industries, investigated the possibility of building a mill on the East Coast. Large quantities of Southern Pine were shipped to their Central Chemical Laboratory in Shelton, Washington. When it had been established by laboratory and commercial tests that a sulphite pulp equivalent to the quality produced in their West Coast mills could be made from Southern Pine, negotiations were completed for the construction of a modern plant at Fernandina, Florida. The mill was originally scheduled for completion in August of 1938, but due to the general slump in world markets, construction was delayed until the end of 1939.

The new plant is of particular interest since it is the first mill to be constructed in the South for the commercial manufacture of dissolving pulp from Southern Pine.

Fernandina is located on the Northeastern coast of Florida, on Amelia Island, and has one of the oldest seaports in the South Atlantic, formed by a tidal river (Amelia River), which separates the island from the mainland. The mill site fronts on this river, thus affording facilities for direct water shipments. Rail shipping is furnished by the Seaboard Air Line Railway.

A channel was dredged and the deposits used as fill for the plant site. The dredging was done by the Arundel Corporation of Baltimore, Maryland.

The mill is constructed of reinforced fire-resistive concrete supported on piling driven to a firm foundation. Other buildings are of heavy wood frame construction, with concrete foundations and floors. The construction job was handled by the Rust Engineering Company of Pittsburgh, Pennsylvania, who also installed the major portion of the equipment.

Water, an important item in the manufacture of sulphite pulp, is drawn from deep artesian wells. A water treatment plant was designed by Charles E. Richheimer of Youngberg & Associates, Consulting Engineers, Jacksonville, Florida. The automatic main zeolite water softener plant and carbonaceous zeolite water softener plant with a capacity of 7,500,000 gallons of treated water per 24 hours, were furnished by the Permutit Company of New York City.

Sea water is pumped from the Amelia River, chlorinated, coagulated and filtered through a battery of three horizontal sea water filters and used to regenerate the zeolite softeners. The boiler feed water is pre-treated with lime to reduce the bicarbonate hardness and then is completely softened by a battery of three carbonaceous zeolite water softeners, which are also regenerated with sea water.

All the machinery throughout the plant is of the latest design and most of it is especially made for this type of operation. The plant is laid out to permit a continuous flow of operation from the

(*Continued on page* 48)

SOUTHERN HIGHWAY DEVELOPMENTS

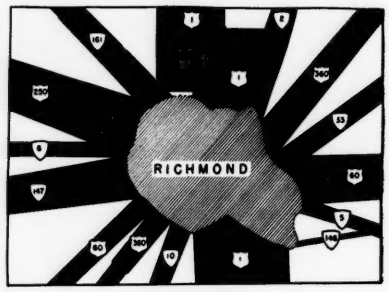
BY

H. J. McDargh

Manager, Southeastern Offices, Portland Cement Association

WITH the South entering what in all probability is its greatest cycle of industrial expansion, development of adequate highway transportation has become increasingly important . . . and increasingly complex.

road building history, we are beginning to get an accurate picture of today's highway needs and those of tomorrow. This material is being made available through the Statewide Highway Planning Surveys now under way in nearly all of the states. Already we know, for example, that to adequately handle traffic on the 70,052 miles of main state highways in Virginia, North and South Carolina, Georgia, Florida, Alabama, Tennessee, Mississippi and Louisiana alone there are the following immediate needs:



RICHMOND AREA

Fig. 1—This traffic flow map of the main state highways entering Richmond shows why metropolitan traffic is reaching the point of complete congestion. Only by cutting expressways through the city can the huge volume of traffic be adequately handled.

(From testimony of W. C. Markham of the American Association of State Highway Officials before Hearings of Committee on Roads, House of Representatives, 75th Congress, 3rd Session.)

Nature of Work	*Estimated Cost*
5,222 miles should be rebuilt.	$151,630,000
6,880 miles should be widened	160,480,000
3,303 miles should be relocated	114,250,000
4,627 bridges should be widened and rebuilt	87,050,000
Total	$513,410,000

This staggering total is not visionary. It represents the integrated views of nine state highway departments and considers only the immediate needs of a limited mileage of main roads, let alone future requirements.

In forecasting future highway needs,

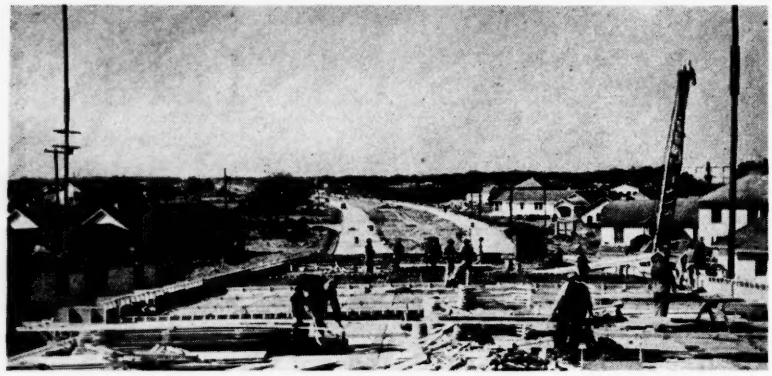


Fig. 2 (above)—When completed this spring, the last link in Louisiana's airline highway will carry traffic over a railroad, canal, street and on down to the heart of New Orleans' business district. Fig. 3 and 4 (below)—Divided lane concrete highways move traffic swiftly and safely in South Carolina. Right — entrance to Charleston and left—a section between Greenville and Spartanburg. Highways like these emphasize the crawling traffic common to most metropolitan areas.

In brief review, the status of our highways today is about as follows:

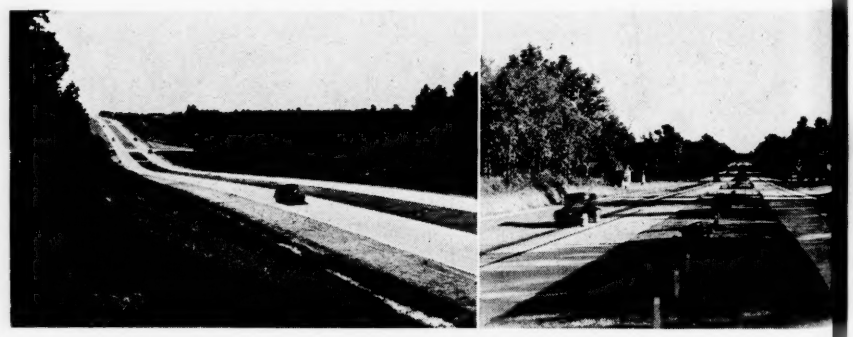
28 per cent of the nation's main state highways, most of them built in the past 15 years, are obsolete because of the tremendous increase in traffic and the rate of speed at which it moves. Almost without exception, in metropolitan areas throughout the nation traffic has reached a point of near-stagnation.

We have only just begun to make a dent in the huge mileage of secondary roads awaiting improvement.

In spite of this huge backlog of unfinished highway business, the United States each year diverts 15 per cent of its highway funds to purposes unrelated to roads. In 1939 alone, known diversions amounted to about one hundred and ninety million dollars—ample to build a divided concrete highway equivalent in length from Miami to Chicago.

Add up all these facts and the complexity of the road building job ahead of us becomes apparent.

However, the highway horizon is not completely dark. For the first time in



we must be guided by the Highway Planning Surveys, for it is the purpose of these investigations to develop long-range highway programs fitted to the traffic needs of today and tomorrow.

Virginia is one of the first states in the nation to have completed its survey. From data developed in that state, some idea of the tremendous job ahead can be gathered. If, during the next 20 years, Virginia is to successfully handle the 100 per cent increase in traffic expected, cut down the increasing traffic accident toll and alleviate current difficulties, the State Highway Department must provide an integrated system consisting of:

1,387 mi. of four-lane, divided, high type highways

1,548 mi. of three-lane, high type highways

4,349 mi. of 22-ft. two-lane, high type highways

18,913 mi. of low type, secondary highways

. . . and find some method of handling 19,283 miles of land service roads carrying less than 25 vehicles per day.

To do the job will require an expenditure of some $600,000,000, all of which must come out of motor vehicle revenues. Obviously, there is no room for diversion or for ill-planned efforts. Multiply this program by ten and the size of the task facing the Southern highway construction industry becomes apparent.

Turning from work ahead to current endeavors aimed at solving the South's highway transportation problems, I'd like to call attention to Public Roads Administrator Thomas H. MacDonald's excellent document: "A Master Plan for Free Highway Development."

"One of the striking characteristics common to all highway traffic maps," this report states, "is the sharp enlargement of the bands representing the volume of traffic on the important highways as they approach the larger cities. (See Fig. 1.) Unfortunately, it is not common to find the capacity of the highway proportionately enlarged."

Perhaps the most outstanding city entrance work in the South is under way in New Orleans, where the State Highway Commission is driving the Air Line Highway down into the heart of the business district. (See Fig. 2.) Limited in access, this divided-lane concrete expressway sweeps up over a highway, a canal and a railroad, depositing traffic on Tulane Avenue, a 130-foot wide, divided-lane street. In contrast with most cities, obtaining right of way presents little or no difficulty, since all the main streets were at one time plantation drainage canals. By filling in or covering over these canals, the city has secured a neutral ground and an average right of way approximately 130 feet wide.

Top to bottom—Fig. 5—Red concrete on the third lane keeps slow traffic to the right on this uphill section of U. S. 31W near Nashville, Tenn. Fig. 6—Robert E. Lee highway north of Roanoke, Va. and figure 6a after it was widened with concrete sides. When traffic again demands widening, the center macadam lane will be torn up and planted as neutral ground. Fig. 7—Construction under way on a 23-mile section of soil-cement highway between Pontotoc and Houston in Mississippi —soil and cement being mixed by machine. Fig. 8—Compacting soil-cement pavement in Columbia, S. C.

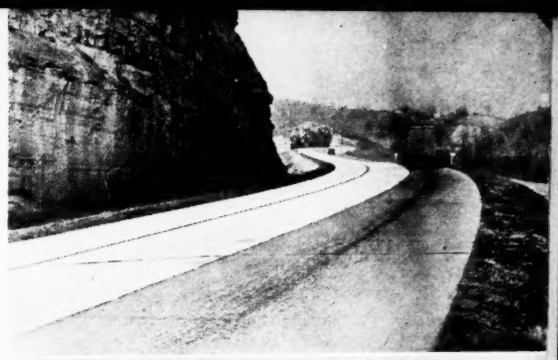
Similar to Louisiana's Air Line Highway are the approaches to Greenville, Spartanburg and Charleston, in South Carolina. (Figs. 3 and 4.) These beautiful examples of divided-lane concrete construction, however, have yet to be cut through into the business sections.

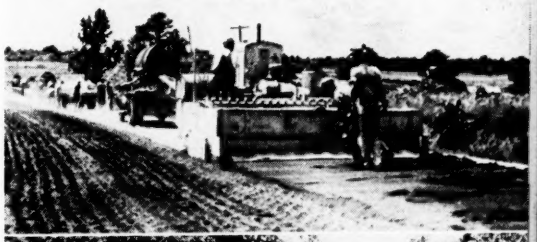
In spite of these initiatory examples, most highway administrators believe that before any real progress in city entrance work can be expected, some method must be worked out for the acquisition of right of way in metropolitan areas. Mr. MacDonald suggests Federal investment subject to amortization over a 50-year period.

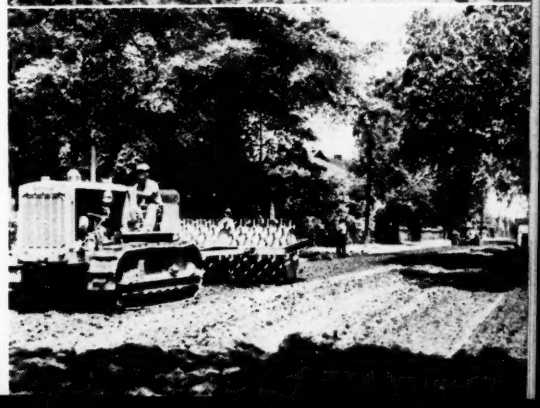
Next in importance to relieving city congestion comes widening, straightening and rebuilding main highways in rural areas. Two particularly interesting projects come to mind—one, a relocation in Tennessee; the other, a widening job on U. S. 11 in Virginia's famed Shenandoah Valley.

Recent studies of truck-climbing ability show that even moderately loaded trucks cannot sustain a speed of more than 20 miles per hour if the grade exceeds five per cent. W. M. Rees, engineer of Design and Surveys for the Tennessee Highway Department, kept this in mind when relocating a 2-mile section of U. S. 31-W about 15 miles north of Nashville. At this point 31-W carries heavy truck traffic north into Kentucky. The relocated section runs through deep rock cuts at a 5.5 to 6 per cent grade. In order to relieve the congestion that would have resulted had an ordinary two-lane road been built, Rees decided to add an extra lane on the right-hand side going up grade. This lane was topped with two inches of red concrete. (Fig. 5.) At the bottom of the grade, arrows and a sign on the pavement direct slow moving traffic over into the extra lane. Watching traffic behavior one afternoon for about an hour, I noticed that every truck pulled over on the red lane as it hit the up grade, while fast traffic whizzed straight ahead on the white concrete. Rees reports that no accidents have occurred since the project was opened last August. Further work of this type is planned.

(Continued on page 48)







BRIDGING THE MISSISSIPPI RIVER

BY

John A. Fox

Secretary, Washington County Chamber of Commerce, Greenville, Miss.

THE Mississippi River barrier, separating the Eastern and Western Southern States, is about to be overcome, so that within a year there will be a physically united South from the Potomac to the Rio Grande.

Within a year, six bridges, averaging about one hundred miles apart, will be spanning the great river between Cairo and New Orleans, giving easy access to Arkansas, Oklahoma, Louisiana, and Texas from the East.

The Harrahan bridge crossing the river at Memphis was opened to the public on July 15, 1916, and during the last two decades has contributed more than any other one factor to the rapid agricultural and industrial growth of Arkansas.

On April 28, 1930, the bridge across the river at Vicksburg was opened, and a tide of traffic flowed into Northern Louisiana and Eastern Texas, contributing largely to the remarkable growth of Monroe, Shreveport, and Dallas.

The Huey P. Long bridge at New Orleans, completed and opened to traffic on December 16, 1935, was the realization of a dream that had existed in the minds of the southern people for more than one hundred years. Thousands of tourist cars travelling from the North and East to California during the spring and winter months now cross at New Orleans on this magnificent free bridge spanning the river at that point.

Bridges across the river are now being erected at Baton Rouge, Natchez, and Greenville, and all three of them will be ready for traffic by the end of 1940.

The bridge at Greenville, Mississippi, 140 miles south of Memphis, will be completed and opened for traffic next July, thus closing the gap in the transcontinental route from New York to California via US-82. It will have cost about $4,500,000—45% of which was furnished by the Public Works Administration and the remaining 55% by the Reconstruction Finance Corporation as a loan.

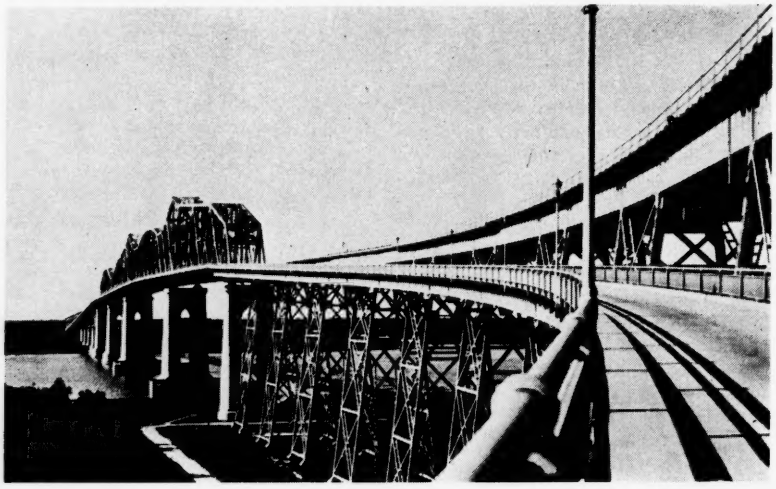
The contract for erecting the main river piers was let to the Massman Construction Company last December, and they are now nearing completion.

Contract for the substructure on the two approach viaducts—6,000 feet on the Mississippi side, and 2,100 feet on the Arkansas side, was let to the Frank V. Ragsdale Company of Memphis early last spring and that work is now 90% complete.

Bridges across the Mississippi River now are located at Cairo, Memphis, Vicksburg, and New Orleans. By the end of 1940 three others will have been completed at Greenville, Natchez, and Baton Rouge, making an average distance of 100 miles between each bridge.

The superstructure was let to the American Bridge Company last summer, and that firm is now erecting the first span. There will be three of these—pier No. 10 to pier No. 11—640 feet; pier No. 11 to pier No. 12—840 feet; and pier No. 12 to pier No. 13—640 feet.

Bridging the river at Greenville, Mississippi, will unite the two richest areas of Mississippi River Delta lands—the Yazoo Delta on the east and the Tensas Delta on the west; and just as the Harrahan bridge at Memphis opened up the rich St. Francis Basin of Arkansas when it was completed, so will the bridge at Greenville open up a vast rich territory in Southern Arkansas and Northern Louisiana.

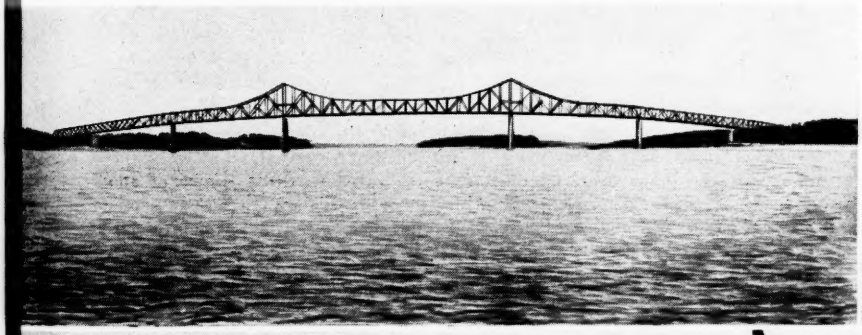


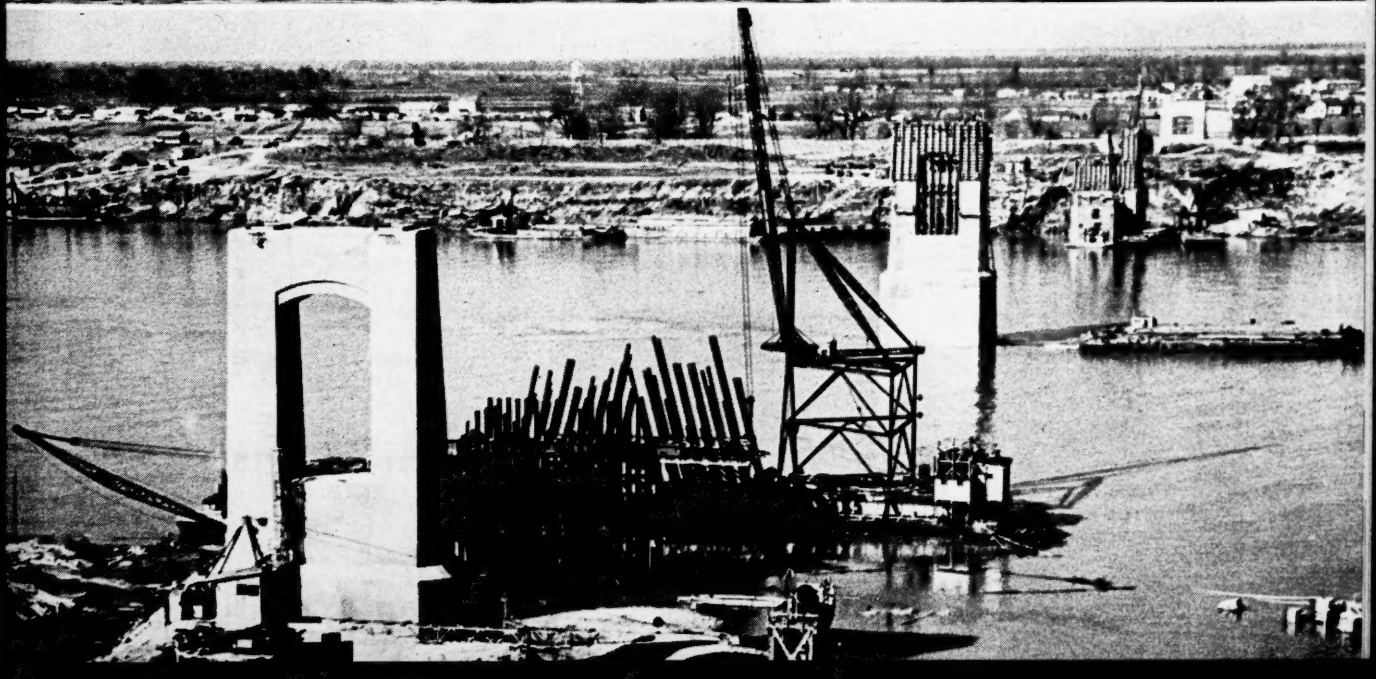
Huey Long bridge at New Orleans, La., where U. S. Route 90 crosses the Mississippi river.

BRIDGING THE MISSISSIPPI RIVER

Above—With the last spans in place, the bridge at Baton Rouge, La., is now nearing completion as this photograph, taken last month, shows. Right—The start of the superstructure on the Greenville, Miss., bridge was made last month and will be completed next July when the transcontinental route from New York to California via U. S. 82 will be complete and open for traffic. Below, left and right—The bridges across the Mississippi at Cairo, Ill., and Vicksburg, Miss., both of which have been completed for many years. Bottom—Completing the piers for the bridge at Natchez, Miss.

Photo of Natchez bridge by L. L. Galloway, Natchez, Miss.





NAVAL STORES STUDIES

BY

C. F. Speh

Principal Chemist, Naval Stores Research Division, Bureau of Agricultural Chemistry and Engineering, United States Department of Agriculture

IN discussing naval stores it is usual to explain that the term does not refer to supplies for the Navy, but rather to certain modern products of southern yellow pine trees which once supplied the tar and pitch for wooden sailing vessels. Of these, gum spirits of turpentine and gum rosin produced from the living pine are the most important.

That this important industry is undergoing drastic changes is not surprising; rather, it is surprising that it has been possible for such an important industry to postpone for so long these economic changes, which have been forced upon nearly all other industries.

Over three centuries have passed since the first naval stores was made on the North American Continent in Nova Scotia about 1606. The industry migrated to the Virginias and later, as the timber supply diminished and following the sawmills, moved south and westward to the Carolinas, Georgia, Florida, Alabama, Mississippi, Louisiana, and into eastern Texas, which area constitutes the present gum naval stores belt. With what appeared to be an inexhaustible supply of raw material, the living southern yellow pine, it is easy to understand that methods which are now recognized as wasteful were adopted and continued in use for many years. These wasteful practices existed not only in the handling of the timber but also in the production, collection and handling of the crude oleoresin from which the turpentine and rosin are obtained.

The original receptacle for collecting the crude gum, a cavity cut in the base of the tree, has been replaced by a cup and gutter which are far less destructive to the tree. The lather's hatched has been replaced by a specially designed cutting tool called the "hack." With this tool it is possible to control the depth of the wound or "streak" inflicted weekly on the tree and the rate of ascension of the "face" or the collection of streaks. The iron kettle has been replaced by a copper still. These were the major changes within the industry from the days of the Colonies until about 1915. For some years after 1915 refinements in the use of the cup and gutter system, in the method of collecting the gum or "dipping," and methods of stilling constituted the major changes. great as the changes have been since the beginning of the industry, there are even greater ones in progress, changes which will have an even more far-reaching effect on the future of the industry.

During the peak-production years practically all of the gum was produced from timber leased for the right to work the trees for turpentine, the owner of the timber being a sawmill operator or someone interested only in subsequently selling the timber for sawmill purposes. With the heavy cutting by the mills and the rapid depletion of the virgin pine, there has been a change in character of ownership. Timber lands and reforesting areas are now owned in smaller blocks and the greatly increased number of owners are becoming interested in forest management. This change in ownership is affecting the leasing system. Now when timber is leased, the owner will insist in most cases upon the inclusion in the lease of definite conservation measures such as the minimum size tree to be worked, maximum width of face, depth and height of chipping, and protection against fire. This increase in the number of owners of pine lands has brought an increase in the number of owners turpentining their own timber. Since in most instances the production of gum is too small to justify the operation of a still, the producer must sell his gum. This has resulted in the construction of a few cen-

The evolution of the turpentine cup. From top to bottom—The Cut Box. The Herty Clay Cup. The Metal Cup. The Modern Glass Cup.

The old and new in fire stills

tral stills affording a market for such gum.

It is this increase in gum farming which will force the further development of central processing plants from which will flow gum naval stores products more nearly standardized and better suited for specific industrial uses, and even special products derived from turpentine and rosin. These central plants will require new technique in handling the crude oleoresin and new methods in processing, which will result in a change in methods of marketing. The crude oleoresin or gum, as purchased from the gum farmer, will be classed for yields of turpentine and yields and grades of rosin.

Another factor which will have considerable influence on the trend of the naval stores industry is the increasing recognition of a timber management program applied, alike, to large and small holdings. This program, the adoption of which is urged by the United States Forest Service, will combine the interests of the gum naval stores and pulpwood industries, making available an increasing amount of timber. A survey made by the United States Forest Service several years ago indicated that the gum naval stores industry would be capable of producing annually, on a sustained yield basis, 800,000 barrels of gum turpentine and its accompanying rosin. The present average annual production is approximately 500,000 barrels.

The probable ultimate increase in production of gum naval stores and the trend towards a gum industry very similar in character to the dairy industry with its large number of small dairymen, its "pick-up system," and its central processing plant producing a wide variety of products, form the basis for the program of work of the Naval Stores Research Division of the Bureau of Agricultural Chemistry and Engineering of the United States Department of Agriculture.

The studies embraced in this program fall into three major groups, namely: (1) Fundamental studies to learn the exact composition of pine oleoresin, turpentine and rosin, to determine the properties of each component and how each is affected by various methods of handling and processing, and, finally, to produce derivatives of the various components; (2) Technological studies on the utilization of naval stores, in which endeavors are made to apply the knowledge gained from fundamental research to practical purposes; and (3) Production studies to devise and develop improved methods and equipment for gathering and processing the crude gum and handling the finished products. These last-mentioned studies are carried on at the Naval Stores Station in Olustee, Florida.

Without disregarding the inestimable value of the fundamental and technological studies, industry is primarily interested in the final product and the method of its production. It was in recognition of this fact, and to permit investigation of the effects of different methods of processing oleoresin upon the properties of the final products, that the Naval Stores Station at Olustee, Florida, was established. The first problem facing the Station was that of improving the fire still and still setting generally used by the gum naval stores industry. Engineering knowledge was applied to redesign the old fire still setting, resulting in more uniform heat distribution, greater ease of operation, better control and reduced fire risk. As a necessary adjunct to this improved fire still, a method of distillation which greatly improved the products was also presented to the industry.

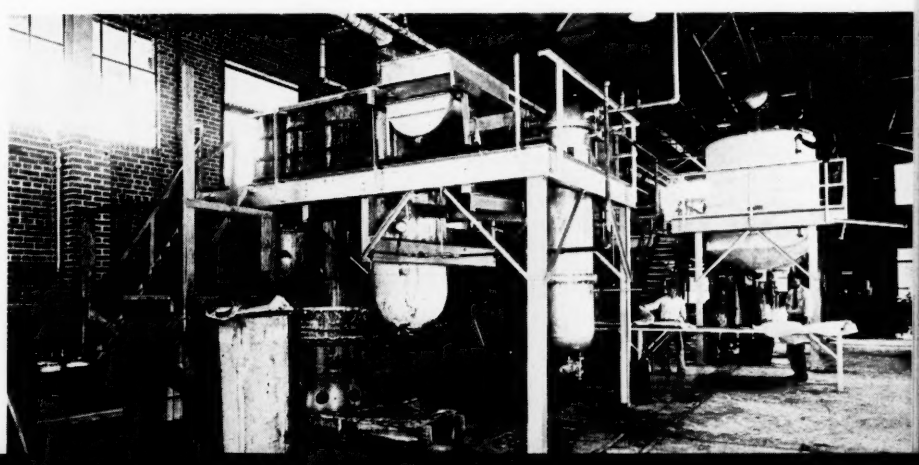
After being developed experimentally, improvements in technique and equipment are introduced to the industry by publications, group meetings, demonstrations at the Station and contacts with the producers by field agents. In this contact work, much credit should be given to the Georgia Extension Service and the Florida Forest and Park Service.

Because of the decided trend toward gum selling and central stills, the Station has carried on studies in gum cleaning and steam distillation of the cleaned gum. A process is being developed which will yield oleoresin free from extraneous matter such as chips, bark, pine needles, sand, and certain water-soluble materials. The rosin produced from such a cleaned gum is truly clean, and considerably brighter than ordinary gum rosin. Such a process in conjunction with a steam still will permit control of the properties of final products. These modern plants, to be successful, must be operated by trained technical men. These men will have a better appreciation of the requirements of consumers and can supply products suitable for specific uses.

A development of particular interest is the new glass turpentine cup which overcomes many of the disadvantages of the clay and metal cups now in use.

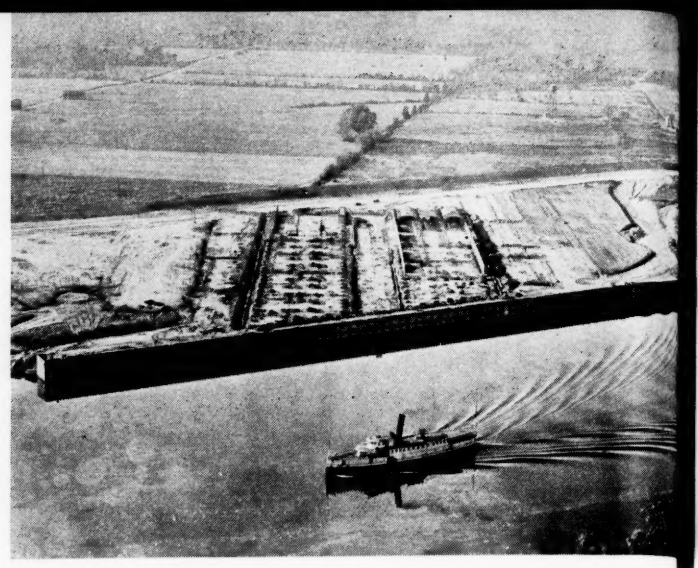
To decrease loss and deterioration of turpentine during storage and shipping, a simple method for the removal of the separated water has been devised and is be-

(Continued on page 54)



Interior of the U. S. Naval Stores Station

RICHMOND'S DEEPWATER TERMINAL



General view of Richmond's Deepwater Terminal now under construction, showing 1250 linear feet of wharf wall and foundations for warehouses.

THE Deepwater Terminal now under construction on the James River at Richmond, Va., is costing $1,750,000 exclusive of grading and drainage, state highway work and purchase of land. The city of Richmond is paying 55 per cent and the Public Works Administration the balance. Work on the Terminal alone is providing an estimated total of 3,990,000 man-hours of labor, according to a survey of the Department of Labor. Of this, 1,140,000 hours are spent at the site, and 2,850,000 are indirect man-hours spent in the fabrication and manufacture of materials. It also has been estimated that from 200 to 800 men are being employed at various periods during construction.

When the job is completed, the Terminal will literally be a little city linked with the Capital of the Old Dominion by a new 120-foot State Highway. The thoroughfare is now under construction on Ninth Street Road, South Richmond, the most direct route to the harbor. Running to a point 4,000 feet from the Terminal, it will meet another strip of concrete leading directly to the port facilities. At the harbor itself will be the turning basin for ocean-going vessels up to 650 feet in length; the huge wharf wall, warehouses, transit sheds, rail and highway connections and other terminal facilities.

The 1,725,000-cubic yard turning basin is costing $345,000, and the 1,250 linear feet concrete wharf wall, $470,000. Seven miles of rail connections and yard tracks are costing $190,000. The two warehouses, with 187,000 square feet of floor area, will be fire-proof throughout, including installation of a sprinkler system. They will cost $434,000.

Other items in the breakdown of the entire terminal cost include: office and utility building, $35,000; electric and domestic water supply, $25,000; paving warehouse area and apron, $36,000; freight handling equipment, $92,000; storage tanks, $45,000; engineering, miscellaneous and contingencies, $78,000; grading and drainage, $311,000; four miles primary State Highway to be built by the State Highway Department without cost to the city, $240,000; land, $175,000.

The Terminal is scheduled for completion on March 1, 1940, but numerous delays make it appear likely at this time that the port will not be open for business until June 15.

Contractors for the various parts of the work are: A. S. Wikstrom, Bound Brook, N. J., $470,444.95, wharf wall (completed); Virginia Machinery & Well Co., Richmond, Va., $20,724.00 well-tower-pump house (completed); Allen J. Saville, Richmond, Va., $433,900.00, warehouses; Atlantic Gulf & Pacific Co., New York City, $344,775.31, dredging completed; Clyde Iron Works, Duluth, Minn., $43,886.00, crane; Davenport-Besler Corp., Davenport, Iowa, $48,310.00, locomotives; A. S. Wikstrom, Bound Brook, N. J., $201,151.18, trackage; Allen J. Saville, Richmond, Va., $27,358.00, office building; Allen J. Saville, Richmond, Va., $10,588.00, utility building and power line; Bidkelhaupt, Inc., Richmond, Va., $2,090.00, water line.

Perfect Safety Awards

Perfect safety records in 1939 were made by the Hudson, N. Y., Northampton, Pa., Universal, Pa., Duluth, Minn., Hannibal, Mo., Independence, Kans., plants of the Universal Atlas Cement Company, United States Steel Corporation Subsidiary.

Continuous operation of these plants for an entire calendar year without a single lost-time accident entitles each of them to a re-award of the Portland Cement Association safety trophy for 1939 which each of these plants has previously received two or more times.

The Universal Atlas Cement Company and the cement industry as a whole were among the first to develop organized safety education for plant workers. Today this has been carried to such a point that the industry has been awarded the Joseph A. Holmes safety award, the highest safety honor for any of the industries reporting to the United States Bureau of Mines.

Twenty years ago not a single cement mill among the more than 150 represented in the industry could boast of no lost-time accidents for a calendar year. Since then plants in the industry have operated for 493 plant years without a single disabling injury. This is all the more remarkable because in a cement plant and its quarries there are trucks and switch engines; high voltage, intense heat and highly explosive materials; large moving machinery; conveyors and cranes. Yet today industrial safety in the cement industry has been so developed that fewer employees are hurt inside the plant gates than outside.

Richmond Bank Appointments

H. Hiter Harris, President, First and Merchants National Bank of Richmond, announces that at the organization meeting of the Board of Directors in January, Guy Tristram Mallonee was promoted from assistant trust officer to trust officer, and Charles Linden Harrison, Jr., was elected an assistant trust officer.

Both men have been associated with the institution for many years. Mr. Mallonee is Secretary and Manager of the Clearing House Association, Richmond, and prior to his promotion Mr. Harrison had been manager of the Accounting and Tax Division of the Trust Department of the First and Merchants National Bank.

Belmont Iron Works Officers Promoted

The Directors of Belmont Iron Works have made the following corporate changes, effective January 1st, 1940:

Joseph G. Shryock, President and Chief Engineer; a graduate of the Pennsylvania Military College 1900; came to Belmont in 1904; was appointed Chief Engineer in 1922 and later made Vice-President, Chief Engineer, and Sales Manager.

John A. Mitchell, Vice-President and General Manager; graduate of University of Pennsylvania—class of 1912; rose to the position of Superintendent of our Eddystone plant and then Production Manager of all plants, which position he held at the time of this corporate change.

SIRUP FROM SWEET POTATO STARCH

BY

Lawrence E. Stout

Professor of Chemical Engineering Washington University, St. Louis, Mo.

SWEET potatoes are a very important vegetable crop in the United States, yet at present almost one-third of the crop is unsalable as such on the open market. This relatively large tonnage of off sized or oversized potatoes represents a serious economic loss to the growers. On the other hand, these unsalable potatoes can be a valuable and attractive source of starch, thanks to the excellent work done at the Laurel, Mississippi starch plant. It now remains for the chemist and chemical engineer to adapt this starch to uses where other forms of starch now are employed. Specifically it means a study of sweet potato starch and its ability to replace such standard items as corn starch, wheat starch, and rice starch.

In America, today, only a relatively small per cent of all the corn grown ever finds its way into the market as cash corn. On the other hand, about half of all the cash corn goes to the corn sirup industry for the manufacture of sirup and corn sugar. This industry is a sizeable one, it is highly developed from an engineering standpoint, and is located near the corn producing centers of the North. It seemed obvious, therefore, to investigate the possibility of substituting sweet potato starch for corn starch in sirup manufacture with a two-fold purpose in mind: (1) to increase the demand for sweet potato starch and (2) to offer a new industrial development to the South.

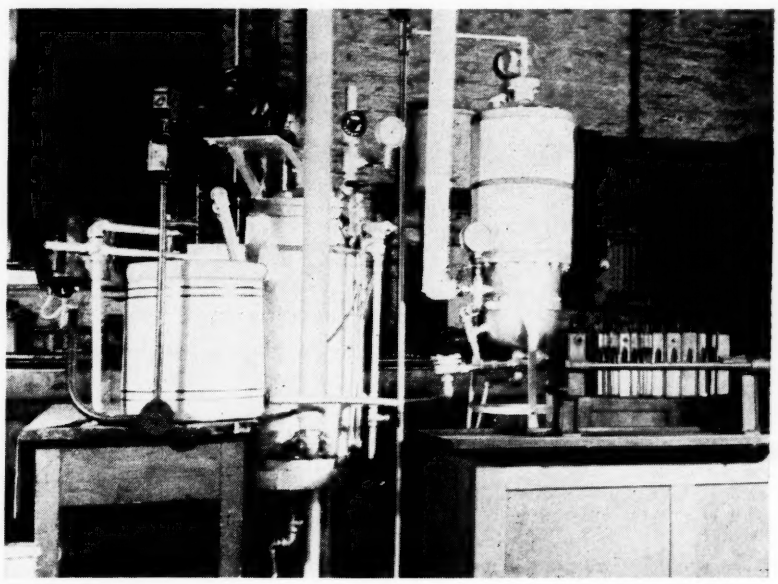
Preliminary work done in this laboratory several years ago showed that, on a laboratory scale, a suspension of sweet potato starch in water could be heated with hydrochloric acid, under pressure, and the product of the reaction would contain mixtures of dextrin, maltose and dextrose. In this way it showed possibilities of competing with corn sirup. The early work on sweet potato starch yielded dark colored, bitter tasting products which were difficult to purify. A workable scheme of purification on one conversion would not be satisfactory on a later run without serious modifications.

As a result, a small scale converter was built so that conversions could be effected under operating conditions which could be controlled or varied at will. The converter was a 20 gallon acid proof bronze autoclave which was provided with an open type steam coil and mechanical stirrer. Into this was charged a slurry of the starch in water (about 25° Be. in strength), hydrochloric acid was added, the pressure established (30 to 50 lbs. gage) by applying live steam, and the reaction allowed to proceed for a predetermined length of time. At regular intervals samples were withdrawn so that the progress of the reaction might be noted. At the end of the reaction period (usually 20 minutes) the converter was discharged, the reaction mixture neutralized of its mineral acid content, filtered, decolorized, and evaporated.

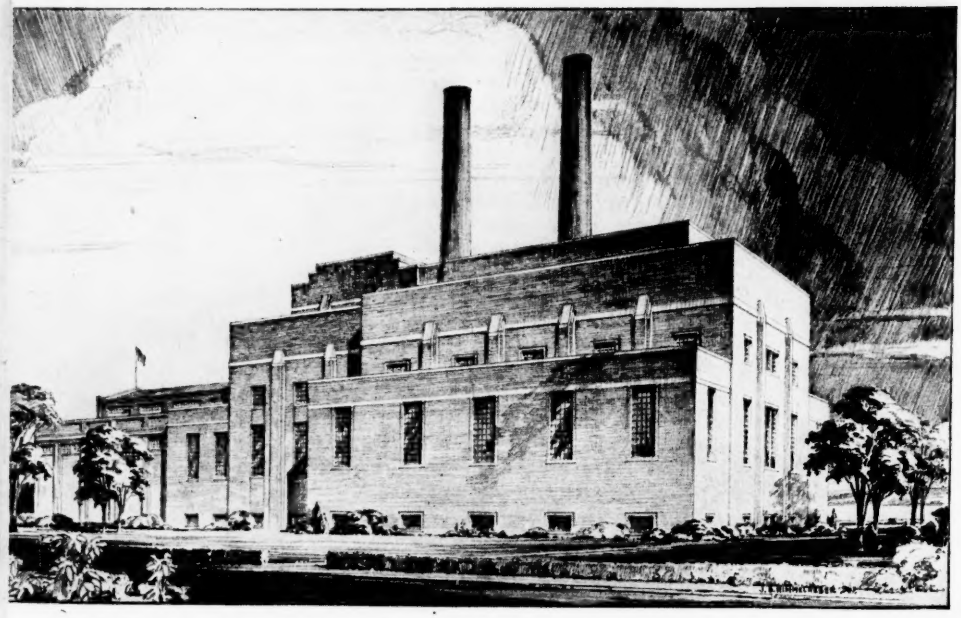
Much might be written about the experimental work connected with these last mentioned operations. Equipment such as used by corn sirup plants is entirely satisfactory for this work but the conditions of acidity must be regulated to meet the needs of this new starch. It must be emphasized that these conditions are not more difficult than those encountered in the conversion of corn starch. They merely are different. Since one starts with a new raw material, the effect of pressure and acid concentration on the rate of hydrolysis must be determined. Quantitative data were obtained in this laboratory to show the increase in rate of reaction resulting from increasing the pressure applied to the system. Similarly a higher acid concentration speeds up the rate of conversion. On the other hand these increased acidities gave a darker colored liquor from the humus material present in the starch and, upon neutralizing, gave to much salt in the finished sirup. This brings up the second point or set of variables investigated, namely, the conditions necessary for the production of a high grade sirup, *i. e.*, the time of hydrolysis, the isoelectric point or optimum acidity for filtration, suitable filter aids, the amount of activated carbon, and the time of contact needed to produce a water white sirup.

A twenty minute period for hydrolysis seemed to minimize subsequent purification problems. The converted liquor had to be neutralized (to a pH of 5.1) and a

(Continued on page 48)



A view of the equipment, used at Washington University, in which sirup was made from sweet potato starch.



Industrial and Road Contracts Increases

South's Contracts Total $59,262,000—*in January*

LOW temperatures accompanied by snow at many points slowed construction considerably in the South during January when the total of contracts as tabulated from reports in the *Construction* daily bulletin showed decreases of eleven per cent as compared with the preceding month and of eighteen per cent as compared with the corresponding month of last year.

The $59,262,000 valuation placed on the projects listed in the construction reports for the month just passed revealed that industrial work was slightly stronger than it was in December and almost double the volume for January of 1939. Highway and bridge contracts also showed gains. Private and public building, as well as public engineering was down.

Industrial building's $9,765,000 with its encouraging upward trend, while comparatively small considering the vast extent of territory in the sixteen States of the South, was nevertheless greater than that for any month of the first quarter of 1939. Road and bridge contracts totaling $14,498,000 in January were higher than they had been since last July.

Residential contracts continued their lead in the private building field, the $5,552,000 total for this type of work representing forty-three per cent of the $9,949,000 figure for January. Commercial building, such as stores, restaurants, garages and filling stations ranked second; assembly buildings, including theaters, churches and auditoriums, third, and office projects, fourth among the private classifications.

The composition of public building work has changed radically since the beginning of last year. In January of 1939, school construction was in the lead, with governmental building pressing closely in second place and housing projects representing only four per cent of the total. Housing work in January of 1940, however, exceeds the others with a percentage of 56. Governmental building is now seven per cent less than it was a year ago. School building is but a small percentage of the total.

The $7,095,000 figure for heavy engineering projects is twenty-two per cent behind December's valuation and less than one-half what it was at this time last year. Governmental electric projects surged forward during January. Airports, dam, drainage and earthwork projects, which in December occupied the top position, dropped into second place. Sewer and water work is now at the lowest point since July 1938.

A review of the larger industrial projects, both ready to begin and proposed showed:

The 1940 construction budget of the Potomac Electric Power Co., Washington, D. C., is $7,230,944, excluding 1939 committments of about $5,500,000, most of which is for completion of a 50,000-kilowatt unit at Buzzard Point.

Estimated 1940 construction expenditures of the Consolidated Gas, Electric Light & Power Co., Baltimore, will be $7,261,312, with a $2,745,729 carryover from last year.

Oklahoma Gas & Electric Company's preliminary budget for 1940 is $1,631,104.

Arkansas Power & Light Co., Pine Bluff, will invest $1,500,000 for new construction.

Virginia Public Service Generating Co., Alexandria, Va., is now ready to proceed on construction of its $2,000,000 steam power generating plant at Union and Wilkes streets, Alexandria, the final formality being cleared away with receipt of permission from the local city council. Approval had already been obtained from the Virginia State Corporation Commission and the Federal Securities and Exchange Commission. The new plant as shown in the photograph at top of page, will contain a new 15,000-kw. turbine generator with closed system of air cooling to eliminate noise. The 80,000-pound per hour boilers, together with the underfed stokers are to be designed for complete combustion in the furnace and in addition are to be equipped with electrical precipitators to prevent discharge of cinders and dust. The building will be concrete and brick, concrete foundations to rest on 55-foot piles. A new railroad siding is to be required and a 42-inch intake pipe will be brought in from the Potomac River to a new screen house. The plant will adjoin the present Virginia Public Service Co. generating plant built in 1936.

Statistics of South's Construction

	January, 1940 Contracts Awarded	January, 1940 Contracts to be Awarded	January 1939 Contracts Awarded
PRIVATE CONSTRUCTION			
BUILDING			
Assembly (Churches, theatres, auditoriums, fraternal)	$1,233,000	$5,595,000	$1,556,000
Commercial (Stores, restaurants, filling stations, garages, etc.)	2,576,000	1,890,000	2,505,000
Residential (Apartments, hotels, dwellings)	5,552,000	5,692,000	10,223,000
Office	588,000	940,000	607,000
	$9,949,000	$14,117,000	$14,891,000
INDUSTRIAL	$9,765,000	$91,323,000	$4,939,000
PUBLIC CONSTRUCTION			
BUILDING			
City, County, State, Federal	$6,390,000	$49,880,000	$9,156,000
Housing	10,187,000	8,778,000	875,000
Schools	1,378,000	4,021,000	11,534,000
	$17,955,000	$62,679,000	$21,565,000
ENGINEERING			
Dams, Drainage, Earthwork, Airports	$2,980,000	$60,301,000	$5,568,000
Federal, County, Municipal Electric	3,035,000	53,891,000	5,390,000
Sewers and Waterworks	1,080,000	10,520,000	3,827,000
	$7,095,000	$124,712,000	$14,785,000
ROADS, STREETS AND BRIDGES	$14,498,000	$35,278,000	$16,896,000
TOTAL	$59,262,000	$328,109,000	$73,076,000

Southern Construction

(By States)

	January, 1940 Contracts Awarded	January, 1940 Contracts to be Awarded	January 1939 Contracts Awarded
Alabama	$1,746,000	$18,217,000	$2,581,000
Arkansas	318,000	5,237,000	1,606,000
Dist. of Col.	1,659,000	47,762,000	3,861,000
Florida	7,208,000	14,255,000	3,793,000
Georgia	3,653,000	10,786,000	3,133,000
Kentucky	3,639,000	19,666,000	721,000
Louisiana	3,593,000	23,558,000	3,125,000
Maryland	2,260,000	13,993,000	3,190,000
Mississippi	3,736,000	11,077,000	4,223,000
Missouri	4,563,000	3,598,000	4,610,000
N. Carolina	1,874,000	11,390,000	4,458,000
Oklahoma	2,669,000	10,701,000	1,582,000
S. Carolina	2,475,000	13,004,000	3,365,000
Tennessee	4,255,000	43,176,000	3,491,000
Texas	9,745,000	58,055,000	19,798,000
Virginia	3,500,000	16,802,000	3,768,000
W. Virginia	2,369,000	6,832,000	5,771,000
TOTAL	$59,262,000	$328,109,000	$73,076,000

Industrial

(Industrial, Electric Railways, Railroads, Buses, Telephones, Docks, Steamships)

	January, 1940 Contracts Awarded	January, 1940 Contracts to be Awarded	January 1939 Contracts Awarded
Alabama	$60,000	$4,936,000	$185,000
Arkansas	.....	1,506,000	250,000
Dist. of Col.	24,000	5,037,000	1,500,000
Florida	275,000	6,161,000	30,000
Georgia	110,000	5,039,000	386,000
Kentucky	225,000	2,948,000	115,000
Louisiana	670,000	6,459,000	65,000
Maryland	150,000	8,298,000	185,000
Mississippi	44,000	2,399,000	75,000
Missouri	265,000	1,678,000	280,000
N. Carolina	49,000	6,976,000	300,000
Oklahoma	2,500,000	2,164,000	120,000
S. Carolina	1,650,000	8,617,000	.....
Tennessee	517,000	14,364,000	49,000
Texas	312,000	4,205,000	899,000
Virginia	860,000	5,447,000	500,000
W. Virginia	2,054,000	5,089,000	.....
TOTAL	$9,765,000	$91,323,000	$4,939,000

Public Building

(City, County, Federal; Housing; Schools)

	January, 1940 Contracts Awarded	January, 1940 Contracts to be Awarded	January 1939 Contracts Awarded
Alabama	$529,000	$125,000	$761,000
Arkansas	142,000	1,084,000	595,000
Dist. of Col.	100,000	35,311,000	603,000
Florida	3,433,000	3,365,000	278,000
Georgia	2,915,000	3,492,000	1,187,000
Kentucky	2,942,000	125,000	606,000
Louisiana	682,000	3,724,000	1,665,000
Maryland	347,000	1,877,000	1,789,000
Mississippi	430,000	2,355,000	254,000
Missouri	1,789,000	467,000	224,000
N. Carolina	272,000	714,000	2,241,000
Oklahoma	74,000	225,000	978,000
S. Carolina	132,000	718,000	2,535,000
Tennessee	949,000	4,565,000	827,000
Texas	2,092,000	3,413,000	2,718,000
Virginia	1,069,000	1,119,000	1,533,000
W. Virginia	58,000	.....	2,771,000
TOTAL	$17,955,000	$62,679,000	$21,565,000

Louisville (Ky.) Gas & Electric Company's preliminary budget for 1940 totals $2,015,615.

Additions and improvements for the San Antonio (Tex.) Public Service Co., will cost $1,031,000.

Dallas Power & Light Co., Dallas, Tex., plans a $500,000 expansion in 1940.

Prince Georges' Gas Corp., Upper Marlboro, Md., will erect a $750,000 storage tank.

Norfolk & Western Railway Co., Roanoke, Va., will expend $20,000,000 in 1940 for new equipment, building coal cars and other additions and improvements. This road let contracts in connection with its $530,000 Lambert Point project.

Betterments and improvements on the Missouri Pacific Lines during 1940 will cost $10,880,000.

Mechanical and roadway improvements of the St. Louis & San Francisco Railway will entail a $3,444,000 expenditure in 1940.

A $161,000 office building is to be constructed at Russell, Ky., by Chesapeake & Ohio Railroad.

Gross expenditure of the Southern Bell Telephone & Telegraph Co., Atlanta, Ga., will be $33,879,000.

Total appropriations of the Chesapeake & Potomac Telephone Co., Washington, will be $5,900,000.

Modernization of the West Virginia plant of Follansbee Steel Co. will cost $1,270,000.

American Viscose Corp., Wilmington, Del., proposes a $7,000,000 rayon plant, with Greenville, S. C., reported under consideration as a possible site.

West Texas Woolen Mills, El Dorado, Tex., will erect a new woolen mill.

Phelps Dodge Refining Co., El Paso, Tex., is proposing to enlarge its refining facilities.

Expansion of refining facilities was started at West Tulsa, Okla., by Mid-Continent Petroleum Corp., cost $2,500,000.

Sinclair-Prairie Pipe Line Co., Fort Worth, Tex., let contract for 66 miles of 8-inch pipeline.

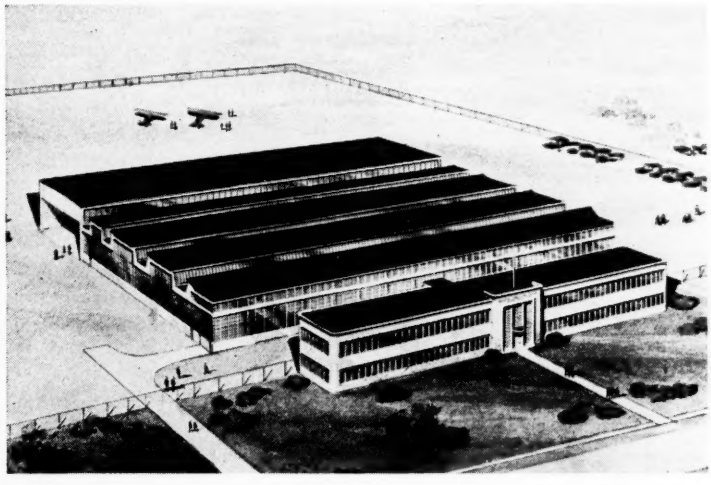
Construction was started on an addition to the methanol unit at Charleston, W. Va., for Carbide and Carbon Chemicals Corp., cost several million dollars. Another report stated that this company was also proposing a chemical plant at Port Arthur, Tex.

Carter Carburetor Co., St. Louis, Mo., started work on a $175,000 plant addition.

Contract was awarded for the $125,000 office, garage and service building at Clewiston, Fla., for United States Sugar Corp.

Improvements had been started at two plants of the Southern Kraft Corp., as efforts were being made by Gordon Browning, former Tennessee governor, to finance construction of a $5,000,000 newsprint mill at Savannah, Tenn.

Perspective of Aviation Manufacturing Corporation's new plant now under construction at Nashville, Tenn., designed by Albert Kahn, Inc., with Marr & Holman, Nashville, associates, and Rock City Construction Co., contractor. The unit pictured will contain 145,000 *square feet, cost* $250,000.



Roads, Streets and Bridges

(Roads, Streets, Paving, Viaduct)
January, 1940

	Contracts Awarded	Contracts to be Awarded	January 1939 Contracts Awarded
Alabama ...	$1,023,000	$12,296,000	$1,311,000
Arkansas ...	.....	742,000	456,000
Dist. of Col.	138,000	99,000	121,000
Florida	1,822,000	1,327,000	274,000
Georgia	.....	1,080,000	437,000
Kentucky ...	.....	35,000	.....
Louisiana ..	827,000	410,000	301,000
Maryland ..	327,000	1,957,000	219,000
Mississippi .	2,907,000	1,217,000	2,455,000
Missouri	1,435,000	.....	.....
N. Carolina.	511,000	1,336,000	327,000
Oklahoma ..	.....	950,000	321,000
S. Carolina..	.....	3,375,000	.....
Tennessee ..	1,267,000	69,000	847,000
Texas	3,639,000	5,782,000	7,219,000
Virginia	471,000	3,379,000	582,000
W. Virginia.	131,000	1,224,000	2,026,000
TOTAL ..	$14,498,000	$35,278,000	$16,896,000

Public Engineering

(Dams, Drainage, Earthwork, Airports; Rural, County, Municipal Electric; Sewers, Waterworks)
January, 1940

	Contracts Awarded	Contracts to be Awarded	January 1939 Contracts Awarded
Alabama	.....	$625,000	$123,000
Arkansas ...	$151,000	1,645,000	245,000
Dist. of Col.	.....	7,230,000	.....
Florida	288,000	1,723,000	306,000
Georgia	10,000	745,000	482,000
Kentucky ...	409,000	16,558,000	.....
Louisiana ..	994,000	12,565,000	590,000
Maryland ..	490,000	1,174,000	162,000
Mississippi .	105,000	4,819,000	1,345,000
Missouri ...	876,000	1,048,000	284,000
N. Carolina.	482,000	1,604,000	1,225,000
Oklahoma ..	95,000	7,064,000	112,000
S. Carolina..	133,000	254,000	147,000
Tennessee ..	939,000	23,516,000	1,293,000
Texas	1,702,000	41,611,000	7,316,000
Virginia	421,000	2,531,000	281,000
W. Virginia.	.....	.....	874,000
TOTAL ..	$7,095,000	$124,712,000	$14,785,000

Private Building

(Assembly, Commercial, Residential, Office)
January, 1940

	Contracts Awarded	Contracts to be Awarded	January 1939 Contracts Awarded
Alabama ...	$134,000	$235,000	$201,000
Arkansas ...	25,000	260,000	60,000
Dist. of Col.	1,397,000	85,000	1,637,000
Florida	1,390,000	1,679,000	2,905,000
Georgia	618,000	430,000	641,000
Kentucky ...	63,000	.....	.....
Louisiana ..	420,000	400,000	504,000
Maryland ..	946,000	687,000	835,000
Mississippi .	250,000	287,000	94,000
Missouri ...	198,000	405,000	3,822,000
N. Carolina.	560,000	760,000	365,000
Oklahoma ..	.....	298,000	51,000
S. Carolina..	560,000	40,000	683,000
Tennessee ..	583,000	662,000	475,000
Texas	2,000,000	3,044,000	1,646,000
Virginia	679,000	4,326,000	872,000
W. Virginia.	126,000	519,000	100,000
TOTAL ..	$9,949,000	$14,117,000	$14,891,000

New Industrial Plants and Expansions in the South During January, 1940

Ala., Decatur—Welsh Dinsmore, LeRoy McInture, etc.; Cheddar Cheese plant .....
Ala., Gadsden—Republic Steel Corp.; slab heating furnace
Ala., Montgomery—Swift & Co.; dairy building .....
Ala., Tarrant City—Teal Chemical Co.; calcium carbide plant
Ark., Pine Bluff—Arkansas Power & Light Co.; 1940 Construction program $1,500,000
Ark., Warren—Southern Lumber Co.; dry kiln reconstruction .....
D. C., Washington—Potomac Electric Power Co.; 1940 construction budget 7,239,044
Fla., Clewiston—U. S. Sugar Corp.; office, garage and service building .....
Ga., Atlanta—Southern Bell Telephone & Telegraph Co.; gross expenditure for 1940 33,879,000
Ga., Atlanta—Atlantic State Motor Lines, Inc.; freight warehouse .....
Ga., Atlanta—National Cylinder Gas Co.; building addition
Ga., Columbus—Provision Co.; plant addition .....
Ga., Columbus—Columbus Coca Cola Bottling Co.; bottling plant .....
Ga., Dalton—J. B. Roach, J. T. Bates; radio broadcasting station .....
Ga., La Grange—La Grange Coca Cola Bottling Co.; bottling plant .....
Ga., Waynesboro—Waynesboro Coca Cola Bottling Co.; bottling plant 50,000
Ky., Louisville—Louisville Gas & Electric Co.; preliminary 1940 budget 2,015,615
Ky., Louisville—Reynolds Metal Co.; aluminum rolling mill
Ky., Russell—Chesapeake and Ohio Railroad; general yard office 161,000
La., Lafayette—Teche Greyhound Lines; bus station .....
La., Lake Charles—Continental Oil Co.; refinery 4,000,000
La., Shreveport—Tri-State Transit Co.; central bus station
La., Winnfield—Carey Salt Co.; storage and packing building 20,000
Md., Baltimore—Crown Cork & Seal Co.; cork storage building .....
Md., Baltimore—Consolidated Gas, Electric Light & Power Co.; 1940 construction budget 7,261,312
Md., Baltimore—Locke Insulator Corp.; galvanizing building addition 20,000
Md., Baltimore—Frankfort Distilleries, Inc.; bottling plant
Md., Crisfield—Eastern Shore Public Service Co.; quick freezing seafood plant .....
Md., Cumberland—Cumberland Coca Cola Bottling Works, Inc.; bottling plant .....
Md., Upper Marlboro—Prince Georges' Gas Corp.; storage tank 570,000
Miss., Columbus—Johnston Furniture Manufacturing Co.; plant reconstruction .....
Miss., Columbus—Pepsi-Cola Bottling Co.; plant reconstruction .....
Miss., Jackson—Scanlon Taylor Millwork Co.; factory building 13,500
Mo., Kansas City—Kansas City Southern Railway Co.; rebuilding freight house .....
Mo., Cassville—Seven Valley Cheese Factory; plant enlargement .....
Mo., St. Louis—Missouri-Pacific Railroad Co.; 1940 improvements and betterments 10,880,000
Mo., St. Louis—Hyde Park Breweries Association 40,000
Mo., St. Louis—Carter Carburetor Co.; plant addition 175,000
N. C., Charelston—Queen City Coach Co., Carolina Coach Co., Smoky Mountain Stages; Union Bus Terminal 125,000
N. C., Greenville—Davis Full-Fashioned Hosiery Mill; plant expansion .....
N. C., Wilmington—Ethyl-Dow Chemical Co.; changes and additions at bromine extraction plant .....
N. C., Charoltte—Charoltte Big Boy Bottlers, Inc.; plant
N. C., Hillsboro—White Furniture Co.; plant expansion ...
Okla., Oklahoma City—Oklahoma Gas & Electric Co.; preliminary 1940 budget 1,631,104
Okla., Tulsa—Mid-Continent Petroleum Corp.; refining plant expansion 2,500,000
S. C., Greenvile—American Viscose Corp.; rayon plant (Greenville being considered as site) 7,000,000
S. C., Spartanburg—Slater Manufacturing Co.; new looms
Tenn., Bristol—Rutherford Freight Line; freight depot and office .....
Tenn., Chattanooga—Station WAPO; radio broadcasting improvements .....
Tenn., Columbia—Maury Locker Storage Co.; cold storage locker plant .....
Tenn., Fayetteville—Farmers' Grain Co.; plant reconstruction 25,000
Tenn., Humboldt—Warner M. Colinsworth; sweet potato processing plant 50,000
Tenn., Kingsport—Borden Mills; long draft equipment...
Tenn., Knoxville—Jefferson Woolen Mill; warehouse 15,000
Tenn., Knoxville—Armour & Co.; meat plant reconstruction
Tenn., Memphis—Nickey Brothers Lumber Co.; flooring mill and dry kiln reconstruction .....
Tex., Austin—Austin Tribune; publishing plant .....
Tex., Austin—Dr. Pepper Bottling Co.; bottling plant ...
Tex., Baird—Texas and Pacific Railway; lake 50,000
Tex., Bay City—Central Power & Light Co.; storage warehouse and garage .....
Tex., Beaumont—Beaumont City Lines; bus terminal ....
Tex., Bonham—John Arledge; cold storage plant .....
Tex., Borger—J. M. Huber Corp.; liquid purification plant
Tex., Bryan—Eagle Printing Co.; printing and office building .....
Tex., Corpus Christi—Central Power & Light Co.; power station superstructure .....
Tex., Dallas—Dallas Power & Light Co.; 1940 expansion program 500,000
Tex., Dallas—First Texas Chemical Manufacturing Co.; building addition .....
Tex., Eldorado—West Texas Woolen Mill; woolen plant
Tex., Fort Stockton—Fort Stockton Pioneer; publishing plant .....
Tex., Galveston—Graughnards Bakery; bakery addition and remodeling 25,000
Tex., Houston—Houston Lighting & Power Co.; substation
Tex., Houston—Hydril Co.; plant improvements 15,000
Tex., Houston—Southwestern Bell Telephone Co.; central office building 475,000
Tex., Houston—Howard Flint Ink Co.; ink plant 75,000
Tex., Houston—Earle M. Jorgensen Co.; plant expansion 25,000
Tex., Houston—Houston Radiator and Fender Co.; building 12,000
Tex., Long View—Landreth Plumbing Co.; new building
Tex., Lubbock—Ralston Purina Co.; plant 250,000
Tex., Marshall—Marshall News-Messenger; publishing plant 20,000
Tex., Mexia—Mexia Textile Mill; plant addition 65,000
Tex., San Antonio—San Antonio Public Service Co.; 1940 additions and improvements 1,031,000
Tex., San Antonio—Better Ice Cream Co.; plant building ..
Texas—Sinclair Prairie Pipe Line Co.; pipe line .....
Va., Appomattox—Rosser Milling Co., mill .....
Va., Lynchburg—Craddock-Terry Shoe Corp.; plant addition
Va., Norfolk—Norfolk and Western Railway Co.; store buildings 46,000
Va., Richlands—Appalachian Power Co.; transformer station .....
Va., Roanoke—American Viscose Corp.; locker and washroom .....
Va., Waynesboro—Wayne Veneer Corp.; plant buildings
W. Va., Bluefield—National Coal Co.; plant addition .....
W. Va., Cedar Grove—Cedar Grove Collieries Co.; tipple reconstruction .....
W. Va., Charleston—Carbide and Carbon Chemicals Corp.; Methanol unit addition .....
W. Va., Morgantown—Monongahela Rail & River Coal Corp.; tipple reconstruction .....
West Virginia—Appalachian Electric Power Co.; improvements 315,000
Aluminum Co. of America—additions at Mobile, Ala., and Alcoa, Tenn. .....

New DIESEL TRACTRACTORS by INTERNATIONAL HARVESTER

Now 4 Sizes

A YEAR AGO we announced the big, powerful TD-18 TracTracTor, a new top for Diesel crawlers. Today International Harvester presents a rugged quartet of streamlined crawlers —TD-18, TD-14, TD-9 and TD-6. FOUR *Diesel TracTracTors for 1940*—big news from the world's leading tractor builder to *all* operators of crawler tractors!

Here's the complete line-up for you to look over—the big fellow at the right, already a popular favorite in the heavy-crawler field; his little brother at the far left; and the step-ups in between. There's not an ounce of lazy horsepower in any of them! They're ready to tackle their weight in wildcats—each one is ready to lick the crawler-power problems in his range!

In this complete series of TracTracTors, INTERNATIONAL offers you a new standard of Diesel performance and economy—perfectly designed balanced power in capacities to meet every demand of crawler-tractor users. Standardize on International and enjoy all the advantages only Harvester can provide. Get the full story from any International industrial power dealer or Company branch, or write us.

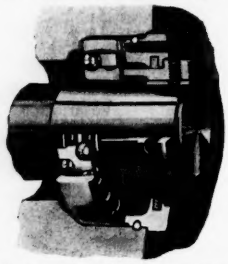
A great variety of specially designed allied equipment available for all TracTracTor sizes.

INTERNATIONAL HARVESTER COMPANY
(INCORPORATED)
180 North Michigan Avenue Chicago, Illinois

New Ways of Doing Things

Ahlberg Simplex Bearing Units

To provide machine manufacturers with a simple and economical means of incorporating ball bearings in equipment where the bearing housing is an integral part of the machine, a new line of bearing units has been developed by the Ahlberg Bearing Company, Chicago. Known as CJB Simplex Machine Units, they are available in three capacities—for light, medium and heavy loads, with either single row, double row or self-aligning bear-



CJB Simplex Machine Units

ings. In the light series the bearings are mounted directly on the shaft; whereas, the medium and heavy units mount through a split adapter sleeve in a tapered bore bearing. Retaining caps are optional either in the open type or the closed type, the latter sealing the bearing completely. Expansion or non-expansion units are also optional. A new type, non-drag seal, using Neoprene as the sealing material, has been developed, the design providing a labyrinth type seal which is frictionless and effectively prevents the entrance of dirt or other harmful substance.

Bright Metallic Zinc Paint

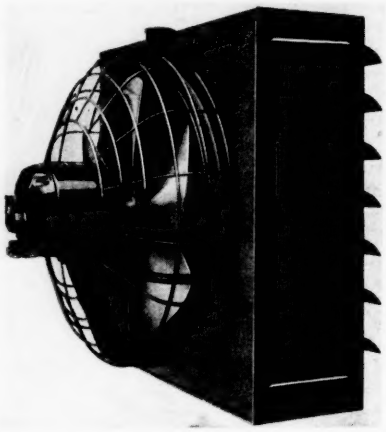
Under the Tainton patents, zinc metal more than 99.99 per cent pure was first produced commercially in 1928, it is said, by electrolytic methods. Latent characteristics of elemental zinc were recognized by industry as fitting it for many new uses, among which are zinc base die castings, more effective coatings for wire galvanizing, foil, stampings, etc. To these, Tainton Products, Ltd., 3100 Elm Avenue, Baltimore, Md., research metallurgists, announce the addition of a bright, lustrous paint pigment of pure metallic zinc flakes. This new product, mixed with the proper vehicles, gives the versatility of brush or spray to a metallic zinc coating, it is declared, and in addition to corrosion-inhibiting properties for which galvanizing is so well known, it produces for the first time among such pigments a bright, metallic finish not unlike that of aluminum "bronze" paints. Thus, in one paint the priming abilities of zinc are combined with a finishing coat appearance. In addition to its use on plant equipment and structure, Tainton Products, Ltd., stress its use for hot surfaces such as stacks and driers, for subsoil uses on pipe lines, etc. It is to be made available also in a grease vehicle as well as in paint form for protection against corrosion.

Cold Tinning Compound for Aluminum

A new tinning compound for aluminum, announced by Glaser Lead Company, Inc., Brooklyn, N. Y., is declared to simplify the use of tin-lead solder to be sprayed on aluminum and to eliminate special aluminum solders and fluxes. With the new tinning compound, the surface to be tinned is prepared in the usual way, after which a clean rag is moistened with water and dipped into the compound and rubbed over the surface to be tinned until a shiny metal coating is formed. This coating then forms a permanent bond with the tin-lead solder which is sprayed on afterward.

Utility Unit Heater

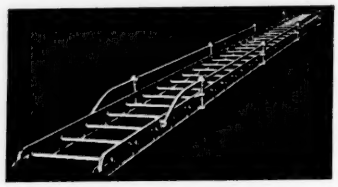
Following a trend toward modernization of the lines and appearance of industrial equipment the L. J. Wing Manufacturing Company, 154 West 14th Street, New York, announces refinements in the construction of its Utility Unit Heater. A new sheet-metal housing, with an attractively enameled finish and a smooth surface devoid of projections, is rigidly braced and bolted to the frame which supports the fan and motor. Wing features incorporated in the heater are: Featherfin heating elements, "Wing-Scruplex" propeller fan, individually adjustable louvres, and a fully enclosed, dust-proof motor. Basic design of the unit is that of the original lightweight, suspended unit heater, pioneered by Wing. It delivers a single column of heated air horizontally and is especially adaptable for use where such a method of heat distribution is desired. The heater is fully described in a 12-page bulletin, available from the company, including piping and wiring details and pertinent engineering data.



Wing Utility Unit Heater

Aluminum Ladders for Industry

Designated as Type 800, a new aluminum ladder especially suited for the storage of materials and maintenance work in industrial plants has been announced by the Aluminum Ladder Company of Tarentum, Pa. The ladder is equipped with handrails on both sides and steel or aluminum spikes on the bottom. Aluminum spikes do not throw sparks and are recommended, therefore, for use around oil tanks or other inflammable materials. With corrugated rungs to prevent slipping, the ladder is supplied in lengths up to 36 feet and in various widths. Entirely of aluminum, it cannot rust, rot, splinter or burn, and is much stronger than ordi-



Type 800 Aluminum Ladder

nary ladders, while its light weight makes it possible to transfer it quickly from one part of the plant to another. Type 800 is the latest model in the line of single wall ladders, sectional ladders and platform ladders developed by the Aluminum Ladder Company.

"Air Master" Dust Collector

Described as an "efficient self-contained dust collector unit urgently needed in every plant where grinding and buffing of any kind is done," the new Cincinnati "Air Master" has been introduced by The Cincinnati Electrical Tool Company of Cincinnati, Ohio, Division of The R. K. LeBlond Machine Tool Company. With the use of the "Air Master," dust and grit-laden air is thoroughly filtered through a series of closely woven fabric and steel wool filter bags and exhausted through an opening in the top of the cabinet. Heavier particles fall immediately into a large tray in the bottom of the cabinet and a foot lever is provided for shaking the lighter ones from the filter bags into the tray, which is removable for easy cleaning. The unit is suitable for use with all makes of grinders and buffers having exhaust outlets, the fan motor being regularly connected into the same switch which controls the grinder or buffer and starting simultaneously with the machine. The fully enclosed motor, suction fan, and filter bags are all completely enclosed in a compact, lacquer finished, insulated cabinet, mounted on rubber feet to insure quiet operation. A metal partition prevents dust and grindings from reaching the motor compartment. The "Air Master" is furnished in two sizes—Type AIR-1 for wheels up to 10 inches in diameter by 1½ inches face inclusive, and Type AIR-2 for wheels over 10 inches diameter up to 14 inches diameter by 3 inches face—with complete piping from exhaust outlets on grinder wheel guards or buffer hoods to dust collecting unit.

Smiles

from ear to ear

Come to think of it, the familiar old phrase was never so true until the telephone came along. Today, the smiles in people's voices *do* span the miles "from ear to ear."

Smiles of joy, of relief, of satisfaction. Not to mention the *smiles of surprise* at how little it costs to get such a big thrill.

Kansas City Life Insurance Company

KANSAS CITY
MISSOURI

45th Annual Statement as of December 31, 1939

ASSETS

Cash in Banks	$ 1,457,202.77
Bonds—	
Federal Government	30,100,229.03
State, County, Municipal and School	20,571,123.10
Railroad, Public Utility and Others	183,667.27
First Mortgage Real Estate Loans—	
On Farm Property	12,460,770.82
On City Property	8,113,333.54
FHA Loans on City Property	4,123,615.91
(Insured and Guaranteed by U. S. Government)	
Loans on Policies	20,021,812.83
(Secured by Legal Reserve)	
Collateral Loans	14,471.26
Accrued Interest on Investments	1,187,991.24
Contracts of Sale of Real Estate	899,565.25
Farm Properties Owned	6,312,364.82
City Properties Owned	3,328,084.40
Home Office Building	1,315,594.08
Net Premiums Deferred and in Course of Collection	2,752,662.82
(Secured by Legal Reserve on Policies)	
Total Net Admitted Assets	$112,842,489.14

LIABILITIES

Legal Reserve	$103,115,640.00
(Present value of Every Policy Obligation)	
Claims Due and Unpaid	NONE
Incompleted Policy Claims	466,753.47
(Claims incurred on which proofs have not been filed or completed)	
Dividends Payable on Policies	1,036,991.50
Interest and Premiums Paid in Advance	710,539.19
Set Aside for Taxes Payable in 1940	255,000.00
Other Accrued Expenses	51,581.42
Surplus Unassigned	6,205,983.56
Paid-Up Capital	1,000,000.00
Total	$112,842,489.14

Gains In 1939

***Legal Reserve on Policies* increased to $103,115,640.00**
***Admitted Assets* increased to 112,842,489.14**
***Total Paid to Policyholders and Beneficiaries* 8,738,657.98**
***Surplus Assets to Protect Policyholders* increased to 7,205,983.56**
***Insurance in Force* increased to the largest amount in the history of the Company . $447,507,267.00**

The Kansas City Life Insurance Company, mindful always of the integrity of its obligations, has year after year strengthened its financial structure to meet changes in the economic world.

We invite our policyholders, both existing and prospective, to examine carefully our 1939 statement and note its significant facts and figures.

The sound and conservative investment policy which has been pursued in the past will be continued. It is our constant guaranty of safety and security to all policy holders, for we are deeply conscious of our sacred stewardship.

W. E. BIXBY, President.

FINANCE » » » and « « « INDUSTRY

Increase In Debt Limit Proposed

Taxation grows with government costs. This is true of states and cities, as well as national taxes. The cost of servicing the present Federal debt is higher than the total annual cost of government not so many years ago. Mr. Morgenthau advocates raising the debt limit to fifty billion dollars, but says we can't go beyond that without facing danger. It is difficult to understand how the able Secretary of the Treasury can assuredly stop short of danger at fifty billion dollars, especially when he knows that obligations which the government has guaranteed and are not included in the debt figures, probably carry us beyond the fifty billion dollars now. Maybe he had those obligations in mind.

The country has gone along in a more or less complacent way with regard to monumental expenditures, but there is increasing evidence that sentiment is getting more conservative. Congress reflects this in its attempts to cut down the budget recommendations. Whether economy will finally prevail waits on the vote. But how we are going to pay the bill already incurred without higher taxes is a puzzle. To pay the debt with present tax rates a lot of prosperity will be necessary.

Wall Street Dull

In a popular broadcast last week the New York Stock Exchange was used as the scene of operations and brokers were called before the microphone to answer questions.

The advertiser sponsoring the program doubtless did not intend it, but the prevailing note seemed to listeners to be stagnation and dullness prevailing at the great market place of Wall Street. Dollar bills paid out to successful brokers for answering questions in more than one instance were said to be the first dollar made this year. The replies brought laughs from the audience, but the significance of it was apparent to listeners. With the vast sums of money that have accumulated and are seeking investment, Wall Street is dull.

Excess Reserves At Record

In the last week of January excess reserves of member banks rose to a record for all time, reaching $5,590,000,000. This represents money beyond the legal reserves banks are compelled to maintain for the protection of depositors. It represents funds for which there is no demand from those entitled to credit. It is evidence of the liquid position of banks throughout the country and of the conservative policy followed in not advancing money except where the risk is considered sound. When business, however, sees its way clearer to borrow for improvements and expansion, these excess reserves will form a broad basis for the development of private enterprise.

Railroad Earnings Grow

Class I railroads of the United States in 1939 had a net operating income of $588,800,000, representing a return of 2.26 per cent on property investment.

The comparison with figures for 1938 which were $373,150,000, or 1.43 per cent on property investment, shows the improved business and earnings of the roads compared with a year ago.

Gross revenues in 1939 amounted to nearly $4,000,000,000,

(Continued on Page 42)

EUGENE MASTERS

City Manager, St. Augustine, Florida

writes:

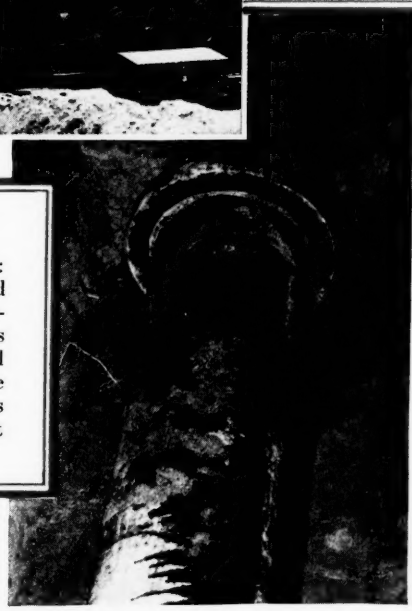
"St. Augustine, Florida, the oldest city in the United States, recently had occasion to open one of the main lines of its water distribution system. While a baby in age as compared to the life records of many cast iron water mains, still a half century of usage left this main in perfect condition, both inside and out. The cost of maintenance of this old cast iron main has been negligible—less than 50 cents per mile per year—there never having been a break of any nature according to our records or the memory of our older employees."

LOW MAINTENANCE

is an economy feature of cast iron pipe that is proved by water works records the nation over. An impartial survey among 195 waterworks superintendents shows that the maintenance cost of cast iron pipe is far below that of any other pipe material which has been in use long enough for the recording of conclusive data.

LONG LIFE

To quote Mr. Masters further: ". . . a half century of usage found this main (*shown at right*) in perfect condition. A 4-inch plug was recently removed for a new tap and this cut revealed that the inside tarred appearance of the main was as clean and perfect as the day it was laid."



SALVAGE VALUE

(*Upper left*) A line of 14-inch cast iron pipe, after 43 years' service in the water distribution system of Kenosha, Wis., was removed and relaid in a new location. Salvage value is one of the major economies of cast iron pipe.

WATER MAINS represent about one-third of this country's 5-billion-dollar investment in public water supply systems. More than 98% of these mains are cast iron pipe with a *known* useful life at least double the *estimated* life of other water main materials. Because the tax-saving, through avoiding replacements, is enormous, cast iron pipe is known as Public Tax Saver No. 1.

CAST IRON

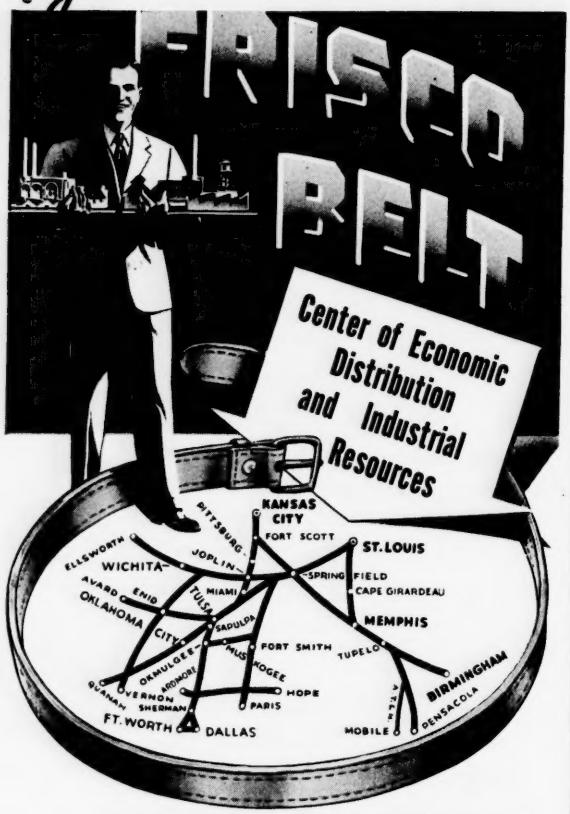
ook for the "Q-Check" Registered trade mark. Cast on pipe is made in diameters from 1¼ to 84 inches.

CAST IRON PIPE RESEARCH ASSOCIATION, THOMAS F. WOLFE, RESEARCH ENGINEER, 1016 PEOPLES GAS BUILDING, CHICAGO, ILLINOIS

CAST IRON PIPE

PUBLIC TAX SAVER NO. 1

Get into the

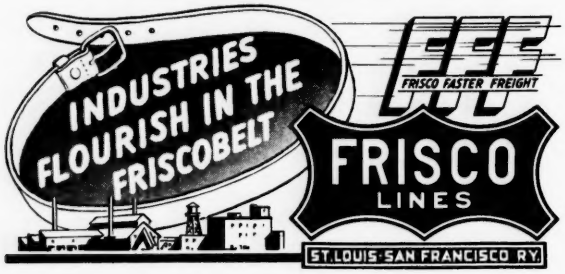


A Ready-Made Market of 16 Million People!

Any manufacturer interested in reducing costs of production and distribution, under agreeable labor conditions, will do well to get ALL the facts about the industrial development of this vast, vigorous and fast-growing area—served by Frisco First. The official data on available hydroelectric and fuel power, raw materials—are too fabulous for treatment in this limited space.

Industries depending upon agriculture will find, in the Friscobelt, ideal soil and climatic conditions for the production of needful commodities. Within the past few years alone, diversified industries representing a capital investment of $100,000,000 have established plants in this area. Your inquiry will bring prompt and complete information. Write

Industrial Department • Frisco Lines
819 Frisco Bldg., St. Louis, Mo.



Finance *and* Industry

(Continued from Page 40)

increasing 12 per cent over the gross revenues of 1938, but still 24.3 per cent below 1930.

In the South the net return was 2.51 per cent on property investment, slightly above the national average.

Capital for Small Industries

Chairman Frank of the Securities and Exchange Commission told the House Appropriations Committee that the work of his Commission has brought it in contact with only a few thousand interests in the country, and indicated the possibilities of investment trusts in the service that might be rendered small businesses seeking loans of $100,000 to $1,000,000. He said that costs are frequently in the way, as these often amount to as much as 20 per cent of the total issued to employ an underwriter.

While the underwriters were absolved from responsibility for the situation, as they have a fixed overhead, at the same time it is difficult for the small enterprise to afford the charges.

Chairman Frank pointed out that neither the law nor the registration requirements acted as an embargo in raising funds for small businesses. This probably is contrary to the popular understanding.

Investment trusts, which would be in a position to invest in entire issues, may be an answer deserving of careful consideration.

Reciprocal Trade Agreements

Reciprocal trade agreements and their continuance are being much discussed. Views differ widely as to the desirability of their continuance. Mr. Hull for years a low tariff advocate, defends the agreements vigorously and sincerely as a promoter of trade with foreign nations. Others just as sincere believe the reverse is the case and that trade has suffered and will be further handicapped by importations from countries where low labor costs prevail.

The subject, in its essence, is reduced to the familiar one of the tariff upon which men have differed for a long time. America has prospered under a protective tariff. Its labor is the best paid in the world, and labor's standard of living the highest in the world. Can we successfully compete with lower labor markets without reducing our standards? It does not seem likely.

Southern Railway Improves Earnings

The improved showing made by the Southern Railway in 1939 is a matter of gratification to the entire South. A preliminary report shows net income of $6,487,000 after taxes and charges, which is to be compared with a loss in 1938 of $497,000.

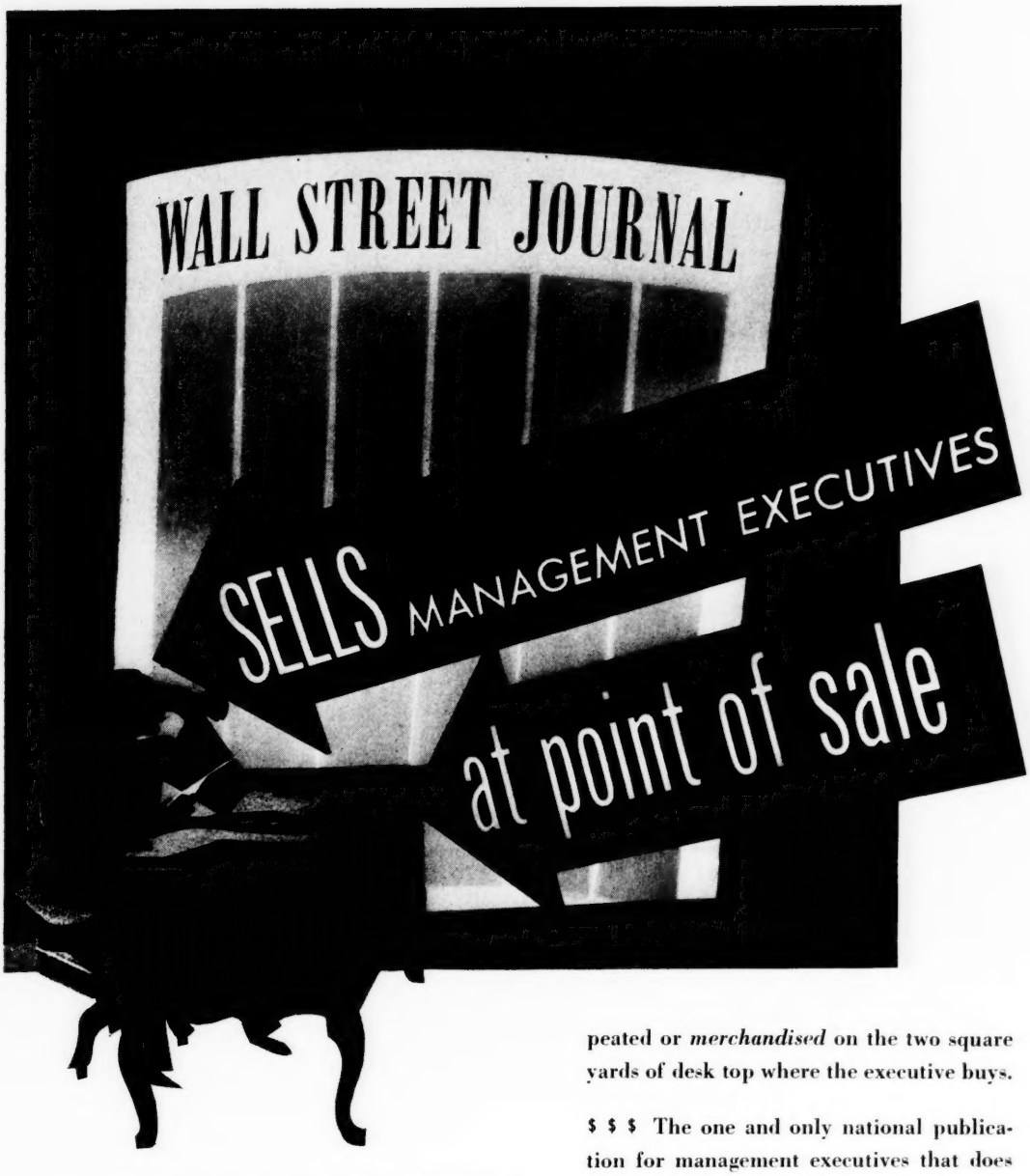
Gross income for the twelve months was close to the $100,000,000 mark.

Taxes And National Debt

B. C. Forbes says "National taxes collected during the last seven lean years were 21 per cent above the total for the seven fairly prosperous years 1923-29, and annual Federal expenditures (excluding debt retirement) averaged fully 2½ times as heavy.

"The Federal debt, direct and guaranteed, ended 1939 some three times as high as at the end of 1929, causing the Administration to worry over the prescribed limitation of Federal debt to $45,000,000,000, even though subterfuges have been resorted to which have made possible the issuing of obligations in excess of that total by Governmental agencies.

"Under the old deal, our national debt was decreased almost $1,000,000,000 annually during the earlier seven years. * * * In the last seven years our national debt was increased nearly $4,000,000,000 each year."



In their offices at their desks, management executives buy direct or through subordinates:

NEW BUILDINGS
MACHINERY
OFFICE EQUIPMENT
TRANSPORTATION
RAW MATERIALS
BANK SERVICE
INSURANCE

—and many other things

$ $ $ Much of the value of your advertising in executive publications that are read at home is lost, unless your message is repeated or *merchandised* on the two square yards of desk top where the executive buys.

$ $ $ The one and only national publication for management executives that does this merchandising job for you is The Wall Street Journal. 86 per cent of its subscribers read it in their offices at their desks.

$ $ $ It gives you, per advertising dollar more readers who are active management-executives of industrial corporations with assets of over $1,000,000 than any other publication—*magazine or newspaper.*

$ $ $ Step up the success of your whole drive to sell management executives by using—

THE WALL STREET JOURNAL

INDUSTRIAL NEWS

Square D Company Acquires Kollsman

The purchase of the Kollsman Instrument Company of Elmhurst, N. Y., by the Square D Company of Detroit, Mich., has been announced. Square D has specialized in the manufacture of motor control and switch equipment in the electrical field, while Kollsman has specialized in equipment for the aviation industry. The deal gives Square D a greater diversity of product, a broader market and an opportunity to apply the precision ideas of Paul Kollsman to its general line of equipment, as Mr. Kollsman, it is said, will remain at least three years with Square D as a consultant, and will offer the company an option to purchase his new inventions. For the present Kollsman manufacturing will remain at the Kollsman plant at Elmhurst.

Pennsylvania-Dixie Cement Appointments

The Pennsylvania-Dixie Cement Corporation, New York, N. Y., announces the appointment of J. M. Wilkerson as Sales Manager, and of J. E. Varela as District Sales Manager, with headquarters in the Rhodes-Haverty Building, Atlanta, Ga. These appointments were effective as of January 1, 1940.

Hercules Powder Appointments

Hercules Powder Company, Inc., Wilmington, Del., has appointed R. W. McKee manager of its office at Birmingham, Ala., and F. George Tresher manager of its San Francisco office.

Koppers-Rheolaveur Installation

Koppers-Rheolaveur Company, affiliate of Koppers Company, Pittsburgh, Pa., has been awarded contract by the Jones and Laughlin Steel Corporation for the installation of a Koppers-Rheolaveur coal washing plant and extensions to the present conveying, crushing and storage system at its Hazelwood by-product coke plant in Pittsburgh. The installation will have a capacity of 6,000 tons per day, and the plant is to be in operation within five months.

United Conveyor Representative

United Conveyor Corporation, Chicago, Ill., manufacturers of the "Nuveyor" Pneumatic and Hydraulic Systems, ash storage tanks, ash pit hoppers, discharge gates, etc., announce the appointment of Frank Howell Company, 318 American Building, Richmond, Va., as District Sales Representative.

Celebrating Twenty-Fifth Anniversary

Established in 1915 by Frank L. and Clarence O'Brien, brothers, The O'Brien Machinery Company of Philadelphia, Pa., is now celebrating its twenty-fifth anniversary. The business of the company is supplying new and rebuilt machinery and equipment for practically all industries. Its facilities include a building with a frontage of 140 feet on Tioga Street and a depth of 210 feet on Allen and Melvale Streets, equipped with 10- and 15-ton electric traveling cranes and provided with a Pennsylvania Railroad siding. The large floor and spacious balconies of this modern structure afford storage space for the machinery and equipment, while the yard adjoining is used for the storage of large steam boilers.

Orschel Joins Perolin Company

As sales manager for its Central Division territory, Herbert M. Orschel has joined the Perolin Company of New York, which is the Sales Division of The Perolin Company of America, Chicago. This company is a pioneer in the manufacture of Boiler Metal Treatments, Rust and Scale Inhibitors, Water Treatments, Industrial Maintenance Paints and Coatings, Refractory Cements and Sanitary Specialties. In its thirty-third year of successful operation, it numbers among its customers prominent names in practically every trade classification. Offices of the Perolin Company of New York are at 551 Fifth Avenue, New York City, and at 1112 West 37th Street, Chicago.

Emerson Joins Roebling

Edward D. Emerson, who has served as sales manager of the Babcock & Wilcox Tube Company, New York City, since 1937, has been appointed General Manager of Sales for John A. Roebling's Sons Company, Trenton, N. J. Prior to his service with Babcock & Wilcox, Mr. Emerson served for several years as Sales Manager with the Jones & Laughlin Steel Corporation. He is a graduate in Mechanical Engineering, Harvard University, class of 1923. His duties with Roebling will begin March 1. The company maintains a Southern branch office and warehouse in Atlanta.

Roebling Makes Williams General Manager

Charles G. Williams, formerly Vice President in Charge of Purchasing and Manufacturing Operations for the fifteen plants of the American Chain and Cable Company, Inc., has been appointed General Manager of John A. Roebling's Sons Company, Trenton, N. J. Born in 1885, Mr. Williams attended Phillips Andover School and later received a degree in Mechanical Engineering from the Sheffield Scientific School, Yale University, Class of 1908. He joined the engineering staff of the Terry Steam Turbine Company after graduation, and in January, 1913, was made purchasing agent of the American Chain and Cable Company plant at Oneida, N. Y. Soon after the acquisition of the Standard Chain Company by American Chain in 1916, he was made general purchasing agent of all plants of the company, and became general production manager in 1928. He was made a director in 1930 and, in 1936 became vice president in charge of manufacturing. Mr. Williams assumes his duties with Roebling on March 1.

Structural Assembly Shop, Navy Yard, Philadelphia, Pa.
49,000 sq. ft. White and 19,000 sq. ft. Actinic, Corrugated
Wire Glass—side wall and monitor construction

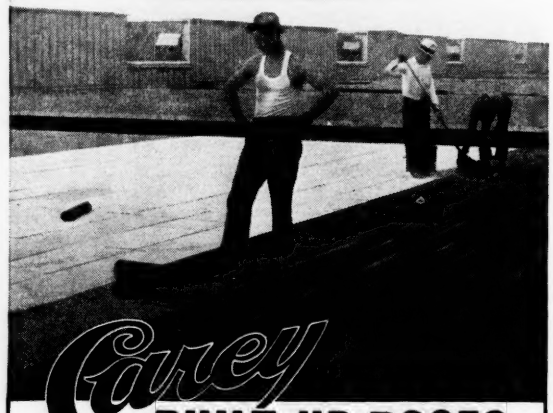
SPECIFY ORIGINAL SOLID CORRUGATED WIRE GLASS

It *diffuses* light with a minimum of shadows. *It is practically* self-cleaning and can be used on a roof of any material and supply daylight in manufacturing and industrial plants—an important factor in all modern production.

Also used with excellent results on sidewalls, marquises, canopies and wherever daylight is needed.

Our Engineering Service Department can aid you on your skylighting problems. Write or wire.

PENNSYLVANIA WIRE GLASS CO.
1612 MARKET STREET
PHILADELPHIA, PENNSYLVANIA



Carey
BUILT-UP ROOFS

Carey Industrial Roofs—built up, layer on layer, with time-proved materials and under specifications that guarantee weather-tight, trouble-free service—are engineered to the specific conditions of climate, vibration, chemical fumes, air conditioning and other factors that affect roof life or plant operation. Bonded for 10 and 20 years.

Carey experience in building better roofs covers upwards of a half century. Whatever your roofing requirements, you can profit by this experience. For details, see our catalog in Sweet's or write Dept. 61.

THE PHILIP CAREY COMPANY • Lockland, Cincinnati, Ohio
Dependable Products Since 1873
BRANCHES IN PRINCIPAL CITIES

GREENVILLE, MISSISSIPPI

In the heart of the richest agricultural area in America, is ideally located for the establishment of industries, and branch houses for the distribution of manufactured goods.

Cheap and abundant gas, oil, electricity, and coal.

Located on the Mississippi River, Greenville is directly connected with every large city in the interior by barge line transportation, affording both direct and competitive rates.

Advantageous transportation facilities by Railways, Waterways, Highways

A $4,447,000 bridge crossing the River now in the course of construction, will open a new gateway to the west.

Good water is plentiful, and labor conditions are ideal.

Average winter temperature 47.6°. Average summer temperature 82.7°.

Having excellent schools, beautiful churches, and well paved streets, Greenville is a delightful city in which to live.

For information, write the

Washington County Chamber of Commerce
Greenville, Mississippi

SHALE BRICK
Common, Face & *PAVERS*
***QUARRY TILE*-Floor Blocks**
Special Shapes from Hard Burned Shale
TO ORDER
Alcoa Brick & Tile Works, Alcoa, Tenn.

DRAWING MATERIALS
Drawing Instruments, Slide Rules, Planimeters, Drawing and Tracing Papers, Drafting Room Furniture, Surveying Instruments, Tapes.
PIGMENT Waterproof Drawing Ink
Catalogue sent on request.
Inquiries solicited.
F. WEBER CO. 227 PARK AVENUE
Est. 1853 BALTIMORE, MD.

We have helped

many businesses that have brought us their financial problems.

Correspondence invited.

BALTIMORE COMMERCIAL BANK
GWYNN CROWTHER, *President*
BALTIMORE, MARYLAND
Member Federal Reserve System
Member Federal Deposit Insurance Corporation

3000 Rooms in the South

Size means little to service, but twenty-five years in pleasing customers in Southern hotels, *plus size*, guarantees your satisfaction in these hotels.

• • •

Dinkler Hotels
CARLING DINKLER, Pres. and Gen. Mgr.

Operating

The Ansley, *Atlanta, Ga.*
The Andrew Jackson, *Nashville, Tenn.*
The Jefferson Davis, *Montgomery, Ala.*
The Savannah, *Savannah, Ga.*
The St. Charles, *New Orleans, La.*
The O. Henry, *Greensboro, N. C.*
The Tutwiler, *Birmingham, Ala.*

IT will pay you to investigate Pensacola's opportunities for industry and commerce. Pensacola invites industry and it has what industry needs. For special information write B. F. Langford, Manager, Municipal Advertising Board—

PENSACOLA FLORIDA *on the Gulf*

"I'M tired of these endless inventory losses. It's plain enough that there's a lot of expensive thievery going on around this plant. Trouble is, we actually invite trespassers. What's to prevent any one from coming into our place whether he has any business here or not? That's the thing we need to correct."

"That's right, Mr. Wilson. Look at the fence around that plant next door. That's what we need. They never have the trouble we do. Nobody's going to get over that barbed wire top and get away with anything. The Cyclone Fence people built it for them years ago and it looks as strong as ever. Why not ask Cyclone to figure on our needs. Their ads say that it won't cost anything to get an estimate."

"Mail this coupon for me, Miss Roberts. We'll see what Cyclone has to offer. They sell more fence than anybody else, so they ought to have just what we want."

CYCLONE FENCE CO., DEPT. 820
Waukegan, Ill.

Please mail me, without obligation, copy of "Your Fence—How to Choose It—How to Use It." I am interested in fencing: ☐ Industrial Property; ☐ Playground; ☐ Residence; ☐ Estate; ☐ School. Approximately.....feet.

Name.....

Address.....

City.....

State.....

FREE! *32-Page Book on Fence*

All the facts you want to know about fence. 14 kinds illustrated. This book will help you choose the right fence for your property—business, school or home. Whether you need just a few feet of fence or miles of it, buy no fence until you see what Cyclone has to offer. Mail the coupon, today.

USS **CYCLONE FENCE**

CYCLONE FENCE COMPANY, Waukegan, Ill.

Branches in Principal Cities

Standard Fence Company, Oakland, Calif., *Pacific Coast Division*

United States Steel Export Company, New York

UNITED STATES STEEL

TRADE LITERATURE

EXPANSION JOINTS—
Bulletin No. 35-20A—devoted to ADSCO Internally-Externally Guided Expansion Joint in sizes from 1¼ inches to 20 inches, including specifications, dimensions, weights and list prices.
American District Steam Company, North Tonawanda, N. Y.

WATER CONDITIONING—
Bulletin No. 2279—illustrating and describing the Permutit Master Pilot Valve (manual or automatic) for controlling cyclic process operations for water conditioning, as are employed in many industries.
The Permutit Company, 320 W. 42nd St., New York City.

FILLING COMPOUND AND TERMINALS—
Bulletin—"Insolozite," a product developed by General Cable to meet the need for a plastic filling compound, insoluble in oils and compounds, for use in process of impregnating paper-insulated lead-covered cable;
Bulletin—"Streamlined Gasketless Type SS Terminals," devoted to a new and improved type of soldered porcelain terminals.
General Cable Corporation, New York City.

GATE VALVES—
Circular No. 504-RL—illustrating and describing Lunkenheimer "King-Clip" Gate Valves, with drain channels and bronze thread bushing in bonnet; available in iron body with bronze trim for steam, oil, gas, air, water and gasoline service, and with various alloy trims for corrosive services.
The Lunkenheimer Company, Cincinnati, Ohio.

REFRIGERATING MACHINES—
Bulletin No. 651-A—"Ice and Frost," office publication, devoted chiefly to Frick Large Four-Cylinder Compressors, illustrated.
Frick Company, Waynesboro, Pa.

HEAVY DUTY DIESEL ENGINES—
Booklet—presenting concise and comprehensive explanation of modern high-speed, heavy-duty Diesel engines; subject matter handled in "question and answer" form and interesting comparisons made between Diesel engines and gasoline engines, also between the two-cycle and four-cycle types of Diesel engines; complete line of Hercules two-cylinder, four-cylinder and six-cylinder engines shown, including Hercules Complete "Power Package" replacement Diesel for Ford trucks for the years 1935 to 1940, inclusive.
Hercules Motors Corporation, Canton, Ohio.

PUMPS—
Bulletin No. 115B—illustrating and describing BURKS Super Turbine Pumps, Water Systems, and Condensation Return Units, including self-priming Super Turbines and straight self-priming Centrifugals for semi-industrial applications; series A-AC-AY-AC-Y, 1100-1400-1500.
Decatur Pump Company, Decatur, Ill.

BRONZE BEARINGS—
Catalogue L-2—"Johnson LEDALOYL Self-Lubricating Bronze Bearings," publication briefly describes these bearings which come in standard stock sizes, of which there are now more than 850 sizes available; lists sizes, part numbers and prices, and presents much technical and application data.
Johnson Bronze Company, New Castle, Pa.

DIESEL ENGINE—
Catalog—"An Alco Diesel for Universal Application," the Alco-Diesel engine illustrated and described, being a development of the original Diesel engine built for Railway Service in 1930 by the McIntosh & Seymour Corporation, Auburn, N. Y., now the Diesel Division of—
American Locomotive Company, New York City

WHITING CRANES—
Catalog—sectional, planned for the greatest possible flexibility, with use of relatively small units all bound together in suitable cover so the catalog would always be up to date; new sections may be added and obsolete sections replaced on short notice; individual sections are also used as Sales Manual units, proposal illustrations, and as individual sales bulletins with correspondence.
Whiting Corporation, Harvey, Ill.

V-BELT DRIVE DESIGN—
Catalog Section 2180—explaining the problems of selecting a V-drive using stock belts in terms so simple and understandable that those without professional engineering training can comprehend them.
The B. F. Goodrich Company, Akron, Ohio.

FRICK VALVES AND FITTINGS—
Catalog K—"Frick Valves and Fittings for Ammonia and Freon-12," the equipment illustrated and described being made, as heretofore, of special "Maypul" steel for strength and denseness necessary for ammonia and Freon-12 work.
Frick Company, Waynesboro, Pa.

COCHRANE DRAINER—
Bulletin 2025—illustrating and describing Cochrane Multiport Drainers for continuously removing condensate under vacuum or positive pressures, as from evaporators, heaters, separators, coils or steam lines.
Cochrane Corporation, Philadelphia, Pa.

BUILDING MAINTENANCE—
Handbook of Building Maintenance — a ready reference work on the maintenance of industrial buildings and structures.
Flexrock Company, 2301 Manning Street, Philadelphia, Pa.

CONVEYORS—
Booklet — "Aluminum Portable Gravity Conveyors," illustrating and describing both the roll and wheel types and recommending the use of these aluminum units when it is desirable to move conveyors from one location to another.
Aluminum Ladder Company, Tarentum, Pa.

Standard Metal Directory—1940 Edition.—This is the eighth edition of the Standard Metal Directory, the previous one having been published in 1936. The old edition has been completely revised and all information brought up to date. Containing more than 600 pages, the new edition is divided into four special sections as follows: Iron and Steel Plans; Ferrous and Non-ferrous Metal Foundries; Metal Rolling Mills; Smelters and Refiners of Non-ferrous Metals. In these sections are presented more than 11,000 detailed reports on steel mills, ferrous and non-ferrous metal foundries, metal smelters, metal rolling mills, and non-ferrous metal plants in the United States and Canada, arranged geographically and alphabetically. The reports give the name of the company, its capitalization, when organized, location of its plants, address of the main office, company officers, purchasing agent, sales manager, plant equipment, number of employees, products manufactured, annual productive capacity, and type of raw and semi-finished materials consumed. In addition, there are special lists of manufacturers and distributors of pig iron, ores and alloys; smelters and refiners of new and old metals; importers and exporters of metals; automobile manufacturers; storage battery manufacturers; solder manufacturers; sheet metal stamping works; galvanizers; die-casting plants; secondary metal smelters; railroad purchasing agents; copper, lead and zinc brands; trade associations in the ferrous and non-ferrous metal industries; scrap iron and scrap metal dealers in the United States and Canada. The directory is published by the Atlas Publishing Company, 150 Lafayette Street, New York, and is priced at $10.00 per copy.

"Industrial Purchasing — Principles and Practice."—This volume is by Howard T. Lewis, Professor of Marketing, Director of Research, Graduate School of Business Administration, Harvard University, and sponsored by The National Association of Purchasing Agents. It is from the press of Business Publications, Inc., Chicago, the list price being $4.00.

With the observation that he has long been of the "belief that neither business executives nor teachers of business in this country have until recently recognized the importance of enlightened industrial procurement policies, especially as related to industrial purchasing," the author, in his preface, states that there are a number of fundamental reasons for the condition and that, perhaps, a contributing cause has been a lack of substantive material dealing with this field. Fortunately, he says, the amount of such material available to the student has increased so substantially in the past half-dozen years as "to correct, to a considerable measure, this earlier deficiency."

That there is a real need for this material, Mr. Lewis cites not only a growing interest in industrial procurement on the part of manufacturers and sellers of goods, but a notable increase in the number of colleges that now offer organized instruction in this subject. This development could not have taken place, according to Mr. Lewis, had there not been available the material upon which to base instruction. The purpose of the present volume is to offer a somewhat broader and more inclusive treatment of the field of industrial procurement than has been available up to now. In the author's words, "the primary objective of the book is to present in an orderly fashion a discussion of general principles which underlie the sound procurement of the materials, parts, supplies, and equipment required by a manufacturer in the normal conduct of his business."

Cotton Year Book.—The world did not produce nearly so much cotton in the 1938-39 season as in either of the two seasons immediately previous, and it did not consume nearly so much as in the season second previous, according to a review of the 1938-39 season contained in the twelfth Cotton Year Book of the New York Cotton Exchange just issued. However, world production of the staple was larger than in any other earlier season with one single exception, and world consumption was larger than in any other previous season. World consumption was moderately in excess of world production in the season, with the result that the world carryover at the end of the season was moderately smaller than that at the end of the previous season.

Production of cotton by the world in the season of 1938-39 was roughly 25 per cent less than in the previous season, this being one of the biggest decreases from one season to the next on record, according to statistics in the book. World production dropped from 36,784,000 to 27,407,000 bales, a decrease of 9,377,000 bales. The greater portion of this decrease occurred in the United States, and was due partly to a reduction in acreage and partly to a lower average yield per acre. Abroad, smaller production was reported by China, India, and Egypt.

World consumption of cotton in 1938-39 totaled 28,518,000 bales, compared with 27,746,000 in the previous season, an increase of 772,000 bales. World consumption records for 1938-39 showed a large increase in the spinning of the staple in the United States, only slight changes in Great Britain, on the Continent of Europe exclusive of Russia, and in Russia, and moderate decreases in the Orient and elsewhere. The world carryover of cotton at the end of the 1938-39 season was 21,462,000 bales, compared with 22,639,000 at the end of the previous season.

COST CUTTING—
Booklet — "Proved Protection Against Wasted Profits," showing how to check vital points where profit-leaks may occur, and suggesting means to correct them.
The Philip Carey Company, Lockland, Cincinnati, Ohio.

Reduce Costs with Overhead Handling
Overhead Handling from process to trucks cut 75% off former cost.
Elimination of congestion increased production from 26 to 48 tons per day.

A 254 page book used as a technical reference for all data covering Mono-Rail equipment will be sent on letterhead request.

Time studies obtained after installation of overhead handling equipment often reveal definite reductions in costs together with more productive use of man-hours.

Mechanical methods provide not only low cost movement of goods but also release skilled labor for profitable production.

This is accomplished in American MonoRail systems by the elimination of floor congestion, by increasing unit loads, by faster and more accurate movement and finally, with the American MonoTractor, by complete automatic transportation.

Compact electrification together with the many exclusive control features of the American MonoTractor, permit the application of automatic equipment to handling problems in nearly every industry. Costs are reduced in direct proportion to the number of man-hours saved.

Engineering consultation with men of long experience in this highly specialized field often brings up hidden possibilities for cost saving or production increases. This service is available at no obligation.

AMERICAN MONORAIL CO.
13109 Athens Ave., Cleveland, O.

Safeguard Against

SABOTAGE, TRESPASSERS TROUBLE-MAKERS

ANCHOR FENCE

STRONG, DURABLE, GIVES MAXIMUM PROTECTION

Anchor Fences safeguard your plant and equipment against the increase in sabotage, trouble-making and trespassing which Europe's War is bringing to industry here at home. Just as they did during similar conditions 25 years ago, wise executives are installing Anchor Fences to completely protect their plants from costly interruption to production schedules, lost profits, danger to human life. Others are adding sections at strategic points, or installing new fence to protect plant expansions.

Anchor's Nation-Wide Erecting Service is prepared to install your Anchor Fence immediately. Send for the Anchor Fence Engineer today. He will recommend the proper Anchor Fence installation to completely protect your plant, and show you the many Anchor features which provide extra protection and longer life, or mail the Coupon now for free Fence Catalog.

SUGGESTION—Since the War broke out, more orders have been placed for Anchor Fences than during any corresponding period for the last 10 years. Our production and Nation-Wide Erecting Service are still able to fill your orders promptly. We suggest, however, that you act quickly.

MAIL COUPON NOW!

Anchor Post Fence Co.
6622 Eastern Ave.,
Baltimore, Md.

☐ Please have Anchor Fence Engineer call.
☐ Send illustrated Industrial Fence Catalog.

Name.....

Firm.....

Address.....

Rayonier Makes Eastern Debut

(*Continued from Page* 25)

chipping plant to the finishing room.

Wood is supplied from near-by stands, and since the mill site is on the inland waterway, a large quantity is barged from the woodlands to the mill. The company owns its own fleet of tug boats and barges. It also owns large tracts of woodlands, which, under a carefully planned cutting and reforestation program in cooperation with the Florida Forest and Park Service, and the United States Forest Service, will insure them of a perpetual supply of wood.

The modernly-equipped control laboratory is under the direct supervision of the Central Chemical Laboratory at Shelton, Washington, and the operations of the mill are guided by experienced Rayonier key men from their West Coast mills.

The Fernandina mill's annual capacity is 64,000 tons, increasing the total production capacity of Rayonier in excess of 300,000 tons.

New Carload Freight Rates

(*Continued from Page* 24)

rier barges taken millions of tons of commodities that move in large volume, but in many cases private industry has established their own water transportation, further reducing the tonnage available for movement by rail.

In commenting on the decision and discussing the establishment of the new trainload, or quantity, rates, Mr. Law said that he considered it a bold move but one that is consistent with the belief that transportation is a specialty of the Illinois Central, rather than that of any manufacturer. He expressed the belief that as in other businesses the railroad should make every possible effort to price its service in a way that will stimulate the greatest possible flow of commerce over its lines.

Varying conditions influence the movement of molasses and it is impossible to accurately gauge the amount of business that will accrue annually as a result of the new rate on blackstrap. The Illinois Central expects to handle approximately 1000 carloads this year.

Although there is much interest and considerable discussion among traffic men in connection with the development of trainload or volume rates for other commodities, no specific proposal is under way at present. It is generally agreed, however, that the possibilities are sufficiently promising to justify thorough canvass of them as a potential source of an enormous volume of traffic that is now moving by other than rail transportation.

Sirup From Sweet Potato Starch

(*Continued from Page* 31)

filter aid used to remove impurities which at first made the sirup hopelessly bitter. When properly done the filtered liquor is quite clear and only faintly colored. Several varieties of decolorizing carbon were tried to remove the last traces of color, then the liquor is ready for evaporation under a vacuum as in the case of corn sirup. The final product is sirup ranging from 35 to 42° Be. which in every respect seems quite comparable with the product of the corn sirup manufacturer.

Much work still remains to be done on this new product. In the first place, no attempt is made to utilize the natural sugars in the sweet potato. These are wasted; the starch is the starting raw material. This opens up a new field of investigation for the agriculturalist, to grow potatoes which (1) yield a larger quantity of starch per acre and (2) produce smaller quantities of undesirable protein materials which lead to purification troubles. The sirups produced compare very favorably with corn sirups for table use (when blended with sucrose sirup and a little vanilla or other flavoring). However, much remains to be done on the comparative usage of the two sirups in such fields as candy manufacture or tanning. No attempt has been made to produce a crystalline sugar from the reaction mixture. These three points merely raise a few of the questions which invite further investigation by the chemical engineer.

There seems little question that the Southern farmer can grow large tonnages of sweet potato starch per acre of land in the South. Sufficient work has been done to show that the starch can be separated, and it now behooves the chemical engineer to extract this starch and place it on the market at a price which is in competition with the other standard varieties of starch. The work completed in this laboratory offers concrete evidence of the worth while nature of such a project in that it offers a potential outlet for considerable tonnage of this important vegetable crop.

Southern Highway Developments

(*Continued from Page* 27)

The Virginia widening project is a praiseworthy example of salvaging an original investment and represents stage construction at its best. When traffic on U. S. 11 north of Roanoke became too heavy for the old 18-ft. macadam road, an 11-ft. concrete section was added on each side and the center section resurfaced. (Fig. 6.) When increasing traffic again makes it necessary to widen this road,

(*Continued on Page* 56)

DESIGNERS AND ENGINEERS

Fabricators of:

Structural steel bridges, buildings, tanks, general plate work, barges, towboats, large cargo vessels, passenger vessels, tankers and refinery equipment.

—o—

THE INGALLS IRON WORKS COMPANY

Birmingham, New York (1 E 42nd St.), Atlanta, Pittsburgh and New Orleans

Address: Birmingham, Alabama

BELMONT IRON WORKS

PHILADELPHIA NEW YORK EDDYSTONE

Southern Sales Offices, Charlotte, N. C.

Engineers . Contractors . Exporters

STRUCTURAL STEEL
BUILDINGS AND BRIDGES
RIVETED-ARC WELDED

BELMONT INTERLOCKING
CHANNEL FLOOR

Write for Catalogue

Main Office—Philadelphia, Pa.
New York Office—44 Whitehall St.

Bristol Steel & Iron Works, Inc.

STRUCTURAL STEEL

For Bridges, Buildings and All Industrial Purposes

Steel Plate and Miscellaneous Iron Work
Complete Stock Shapes, Plates, Sheets and Bars for Immediate Shipment

BRISTOL, VIRGINIA-TENNESSEE

"SAVE WITH STEEL"

ELECTRIC ELEVATORS

FREIGHT AND PASSENGER

Ball Bearing. Push Button Control
Moderately Priced. Installed or F.O.B.

Bulletins and Prices On Request.

WALTER ELECTRIC MFG. CO.

215-217 Cumberland St. Norfolk, Va.

Water Purification Plants

Any Type—Any Purpose—Any Capacity

Dry Chemical Feed Machines
Swimming Pool Filters

E. W. BACHARACH & CO.

Rialto Bldg. Kansas City, Mo.

Filtration and Pumping Equipment

For Water Works and Swimming Pools
Sales and Installation

BURFORD, HALL AND SMITH

140 Edgewood Avenue, N. E.,
Atlanta, Georgia

THERE IS A

DURABILT STEEL LOCKER

TO MEET EVERY REQUIREMENT

Durabilt Steel Lockers are the ideal equipment for clothing storage in

- SCHOOLS AND GYMNASIUMS
- CLUBS, LODGES, AND HOTELS
- FACTORIES, MILLS, AND PLANTS
- OFFICES, STORES, AND BANKS

Advisory Service

Our service is always available for guidance in the solution of special storage problems.

Write for Catalog

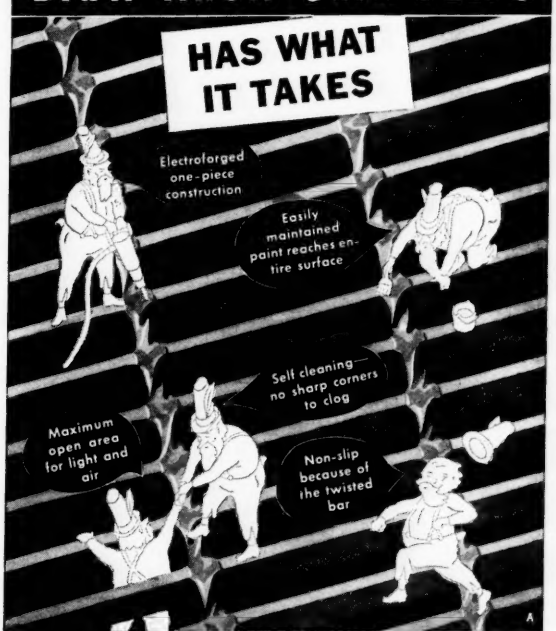
A new and up-to-the-minute catalog describing and illustrating Durabilt Steel Lockers and Cabinets is now ready for mailing. Write for your copy today.

"No better built than Durabilt!"

DURABILT STEEL LOCKER CO.

436 Arnold Ave. Aurora, Ill.

Blaw-Knox GRATING


HAS WHAT IT TAKES
Electroforged one-piece construction
Easily maintained paint reaches entire surface
Self cleaning—no sharp corners to clog
Maximum open area for light and air
Non-slip because of the twisted bar

FREE

Paper weight size sample . . . Just fill in and mail the coupon.

BLAW-KNOX DIVISION of Blaw-Knox Co.
Farmers Bank Bldg., Pittsburgh, Pa.

SEND GRATING SAMPLE TO

Name_____

Street_____

City_____ State_____

LOUISIANA'S SHRIMP INDUSTRY

ONE-HALF of all the salt water shrimp produced in the United States of America comes from Louisiana, the largest shrimp-packing plant in the world being located at Harvey, just across the Mississippi from New Orleans.

In the past six years, New Orleans' shrimp industry has increased from $1,220,525—1933's total, to $2,672,900 in 1938.

Louisiana plants prepare shrimp for market in six different styles—fresh whole, fresh headless, fresh cooked, frozen, canned and dried.

The most complicated process is canning—which necessitates cleaning and picking by hand, after which the shrimp are washed, then boiled in brine, then blanched. After these steps, there is a final repicking. The shrimps are then graded according to size. More than one-half of Louisiana's shrimp production goes into canning, which method has proven increasingly successful since 1875, when bag linings for cans were first used.

Fresh whole shrimp are simply iced. These are used mostly in New Orleans and Southern Louisiana, where the local cooks prefer to buy their shrimp whole and clean them after cooking.

Headless shrimp, fresh, are shipped to inland markets and points on the Atlantic Coast, packed in ice.

Cooked shrimp, with hulls and heads removed, are boiled in brine and packed in tins for shipment on ice.

More than a million pounds of frozen shrimp were sent last year to the Orient, where China is the greatest consumer. These are packed in corrugated boxes, in 5-lb. cartons, ten boxes to the case, and shipped in iced compartments. If stored at zero temperature, this seafood may be kept indefinitely.

The frozen shrimp are specially handled to retain the flavor of "fresh," from which they are indistinguishable as to flavor. The heads and intestinal tracts are first removed, after which the shrimp are washed and packed on trays. These trays are then placed in an icer which freezes them at a temperature of forty degrees below zero. On removal from the freezer, the shrimps are dipped one by one in cold water. They are then returned to the freezer and finally emerge ice-coated. These shrimps are thawed out before being used by the consumer.

Of Louisiana's $2,672,900 shrimp industry, it is estimated that approximately one-half of the catch is utilized in canning. Second in quantity is the amount of fresh headless shrimp marketed each year. The "fresh headless" are packed in barrels of about 125 pounds, between layers of ice.

China also is the greatest consumer of dried shrimps. Only Louisiana produces the sun-dried variety, the process taking three to four days in the summer time, and five to ten days in the winter.

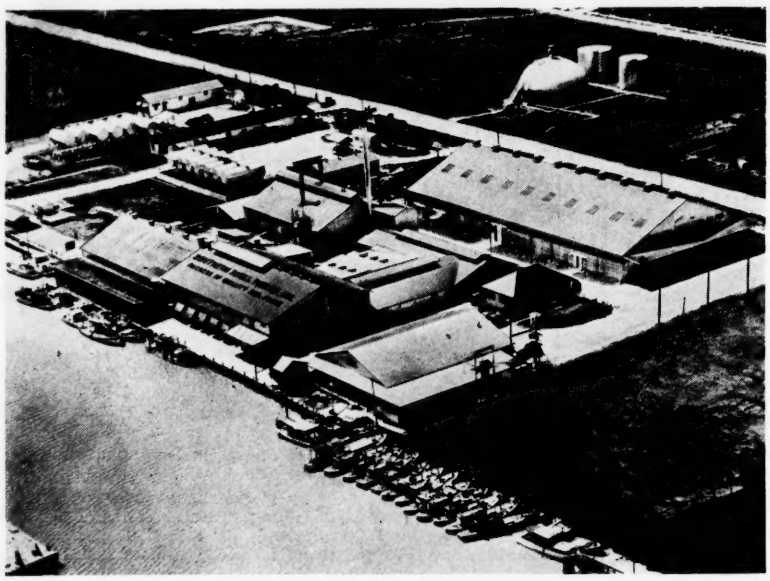
For drying, shrimps are first boiled in brine for 15 minutes. They are then spread on drying platforms built on posts, which allows for the passage of air underneath and around the shrimp. After thorough drying, the hulling is done by automatic appliances and they are finally sent through a blower, which removes any remaining bits of shell.

All shrimp-packing plants are under the supervision of the fisheries division of the Department of Conservation and the canneries are inspected by U. S. Food and Drug Administration officials stationed in New Orleans for that purpose.

In August, the blessing of the shrimp fleet—which consists of more than 200 trawlers and ice boats—is held at Bayou Petit Callou in Terrebonne Parish, about 75 miles from New Orleans.

This ceremony has come down from the first years of the Christian era and was used in the blessing of the galleys which put out to sea from the imperial Venice of the Middle Ages. It is the same as that used to bless the Breton fishing ships of Brittany. It was begun in 1916 in Louisiana by a pastor of Lafourche parish, who was born and reared in France, and the custom has spread up and down the Louisiana coast. It is now an annual event.

Visitors come from all over the country to witness this colorful and unusual ceremony which is held each year, sometime before August 10, the official opening date of the shrimp fishing season in Louisiana.



One of the Louisiana shrimp depots showing the packing plants adjacent to the boats.

Revised Pension Plan

Revision of the United States Steel pension plan, which has provided retirement benefits for eligible employees of the Corporation and subsidiary companies since January 1, 1911, has been announced.

For twenty-nine years the Corporation has provided old-age benefits to eligible retiring employees, and the revised plan is intended to correlate the Corporation pension plan to federal pension laws, the Social Security Act and the Railroad Retirement Acts, which provide pensions to retiring employees based on earnings within certain wage and salary limits.

Benefits paid under the plan will be superseded or reduced by the amount of benefits received under the federal pension plans. Provisions are made for eligible female employees and for eligible employees retiring after December 31, 1939, on account of permanent incapacity or discontinuance of operations, who are not eligible for public pension at the time or retirement until such time as they qualify for public pension or until federal or state pension laws provide benefits for such cases.

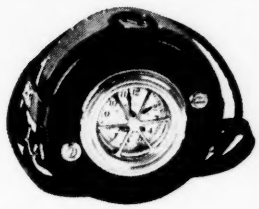
62 YEARS OF WOOD-TREATING EXPERIENCE

are behind the service of Eppinger and Russell Co. Industrial and commercial lumber of all kinds is made immune to termites and dry rot by pressure-treating with ZMA or Creosote. Consult Eppinger and Russell Co. on your requirements in poles, posts, piling, cross ties, cross arms and other timber. It will add 8 to 20 times the natural life to any woods you have treated by this low-cost, dependable process.

PRESSURE-TREATING PLANTS AT:
Jacksonville, Fla., and Long Island City, N. Y.

WOOD PRESERVERS SINCE 1878
EPPINGER AND RUSSELL CO.
84 Eighth Ave., New York City

DETEX
WATCHMEN'S CLOCKS



DETEX WATCHCLOCK CORPORATION
404 Glenn Building, Atlanta, Ga.
NEW YORK • CHICAGO • BOSTON • ATLANTA

LYONORE METAL gives you

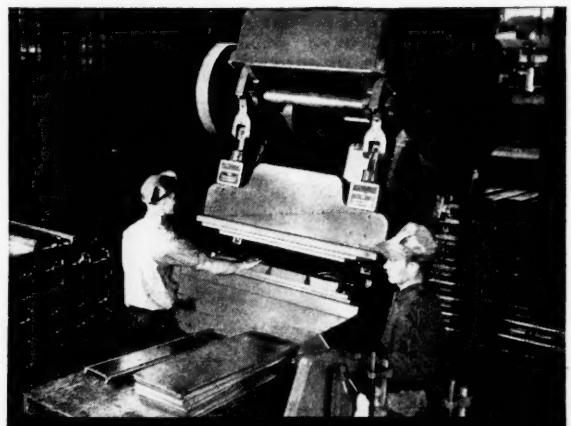
GREATER ECONOMY!

It's money in your pocket to use this corrosion-resistant alloy! Made in one of the largest mills in the world according to an exclusive formula which combines chromium, nickel, copper and iron in such proportions that the alloy lasts years longer than ordinary sheet metals. To get the most for your sheet metal dollar, use genuine Lyonore Metal! Send for details today.

Lyon, Conklin & Co. Inc.
WASHINGTON BALTIMORE

Lyonore Metal
CHROMIUM — NICKEL — COPPER — IRON ALLOY

LET ZINCGRIP BOOST YOUR SALES CURVE



ARMCO ZINCGRIP takes this severe stamping job in stride. There's no flaking or peeling of the zinc on these door slats for grain bins.

• If you use galvanized metal in your products here's a sales-boosting, money-saving tip for 1940: ARMCO ZINCGRIP sheets or coils.

Many manufacturers have found this new kind of galvanized sheet can "take it" in severe forming and in cold drawing operations. The zinc coating clings tenaciously to the base metal; there's no peeling, no flaking. The finish is attractive too. It will do full justice to your product design.

By using ZINCGRIP coils you can fabricate the metal easier and at less cost, speed operations, reduce your inventory of stock sizes and cut down scrap losses. You have a choice of three base metals: open-hearth steel, copper-bearing steel or extra-durable ARMCO Ingot Iron.

Then too you'll find ARMCO ZINCGRIP will give you some convincing talking points for those hard-to-sell prospects. Just tell us what you make or plan to make. We'll send full information about ZINCGRIP. Write The American Rolling Mill Company, 451 Curtis Street, Middletown, Ohio. Offices in all the principal cities.

ARMCO *Armco*

ZINCGRIP SHEETS

GIVE FULL PROTECTION

OUT OF THE RED

BY

Henry F. Unger

WHILE industry during the past two years has been experiencing ups and downs, the Scott-McHale Shoe Co. Ltd. of London, Canada has enjoyed clear sailing, with black figures to show for its efforts.

The basis for the formula of this company's success began, strangely enough, in the severe losses and employee discontent of the years preceding the adoption of the Scott-McHale Labor & Management Relations Plan. Piece work was then in vogue at the shoe plant. Employees were not satisfied to have their piecework prices reduced, which was a necessary procedure in order to manufacture the popular priced shoe that would have kept the plant busy. The firm was thus forced to open a new plant at Tillsonburg, Ontario, where this shoe could be made. There was no strike at any time.

Meanwhile, eager to formulate a plan that would bring prosperity to his plant and secure a new spirit, Mr. McHale sought out the assistance of a friend, a prominent shoe manufacturer in the United States, who had launched successfully a profit sharing plan. With his friend's permission, Mr. McHale picked out the best points of the plan which, together with his own ideas, formed the basis of the Scott-McHale Labor & Management Relations Plan. This required considerable time and thought. Piece work was to be abolished and yet the rights of the 250 employees must be preserved. Finally, at a meeting of all the employees, announcement of the new plan was made and every worker requested to give the matter careful consideration after which each operator was to be interviewed separately. Immediately 85 per cent of the workers were in favor of the new plan.

In proposing the plan in 1937, five essential points were stressed which the management desired to impart to the employees. These were:

1. Management wanted to do its part in assisting to place fair-minded labor, (insisting that the workers were fair-minded) and on that plane of dignity in industry which clear thinking industrialists are agreed they should occupy.
2. The operators should gain a feeling of security, not only in their income, but also in the conditions under which they work.
3. Relieve operators of the worries attendant upon uncertainty of employment and income, which are not conducive to a felicitous home life, thus enabling operators to approach their work with greater efficiency.
4. Give management satisfaction and pleasure in the carrying out of the business, which would come through intimate and friendly contact with the workers.
5. Place in the hands of the dealers and their customers an unqualified guarantee that the workers of Scott-McHale were a group of men and women well paid and fairly treated.

The first step in the program was to lay aside 22.2 per cent of every customer dollar taken in. This 22.2 per cent was the average cost of labor for the ten years preceding the adoption of this plan, and varied less than ½ of one per cent in any year, from 22.2 per cent. This amount was then placed in a Labor Reserve Account. The operators were divided into A, B, and C classifications. The A class, comprising about 85 percent of all employees, consisted of employees longest in service with the company. One group of A employees cannot be laid off should another A group be working. Class B participates in the privileges of the A class, except that they may be laid off in slack times. The C class represents the newest employees and these work on an hourly basis until thoroughly tested. All class A and B workers are given a 'basic rate' or drawing account—such amounts being computed on a yearly basis according to the earning power of each operator in the business as demonstrated by his or her 1937 earnings, proper adjustments being made in all cases where changes in operators' work had occurred in the meantime. This amount is then paid to each A and B operator in 52 weekly pay checks throughout the year.

Under this plan the work week has been reduced from 49½ hours to 45 hours and from 5½ days to 5 days per week. Each A and B operator is entitled to a two weeks' vacation with pay, as well as all legal holidays and days when the operator could not work through no fault of his or her own. The total of such drawing accounts is charged each week against the Labor Reserve Account. Should any surplus be left at the end of the season, it is distributed among the operators on a pro rata basis. If business should fall to such a level as to endanger even the class A drawing accounts earned through allocation of 22.2 percent of the sales, the drawing accounts of all the workers have to be reduced to a point to bring such drawings within the actual amounts being earned so as to keep the amount drawn by the operators within the 22.2 per cent level.

One feature of this plan that makes it stand out in the Canadian industry is the unusual move of management giving up the rights to discharge employees. Instead, an Administrative Committee, made up entirely of employees elected from the various departments in the plant, acts on all dismissal movements. Mr. McHale, while a member of this Committee, has no vote. He does, however, at the request of the Committee, present his views, and gives them the benefit of his experience. The Committee checks slackers, passes judgment on men to be discharged and on new men to be hired. Any employee is free at any time to appear before the Committee to voice his grievances. Since the plan's inception, not one employee has been discharged. New applicants are examined by the Committee and the most capable one is chosen without favoritism.

Under the new plan, the workers, who make one thousand pairs of shoes daily ranging in price from five to twelve dollars each and marketed in all parts of Canada, make $2.65 more in five days than in five and a half days under the piece work system. Labor is no longer considered a commodity to be bought at a price but now possesses a human element. The plan also eliminates indiscriminate price slashing, for if the price of shoes is lowered ten percent, management loses 7.8c while labor loses only 2.2c per pair. Similarly, the employer cannot profiteer on a rising market at the expense of his employees. All these points show why 98 per cent of the workers now are thoroughly in favor of the plan.

Since its introduction, the plan has brought the company and employees profits and it has made the 65,000 square foot factory a real happy home.

LANCASTER TANKS

Elevated Tanks
Pressure Tanks
Steel Storage Tanks
Process Tanks
Butane—Propane Tanks
Standpipes
Retorts
Bins
Extractors
Barges
Dredge Pipe and Accessories
Welded Pipe
Riveted Pipe

General Steel Plate Construction designed for your requirements.

Lancaster Iron Works Inc.
Lancaster, Pa.

KETTLES

Another COLE Product

Processing kettles of all kinds, built for particular requirements. *(For example:* a battery of 15 nickel-clad starch kettles was recently made by us for Lanett Mills, of West Point, Ga.) If it's kettles, kiers, vats, or pressure vessels of any kind you need, our Engineering Department will submit designs. Products made from steel, nickel-clad, stainless and alloy steels, aluminum, Monel metal, etc.

Tank Builders for Over 80 Years!

Other Cole products are: Tanks, Towers, Storage Bins, Standpipes, Smokestacks, Flumes, Castings, Nickel-Clad, Stainless Steel and other Alloy Vessels, Air Receivers, Digestors, Boilers, Jig Boxes, Fabricated Steel Work, etc. *Write for "Tank Talk" No. 27-D.*

R. D. COLE MANUFACTURING CO.
ESTABLISHED 1854
NEWNAN GEORGIA

DAVIS CYPRESS WATER TANKS

LIVE UP TO EVERY CLAIM

New plants coming South naturally install our cypress tanks, once for all for cypress lasts indefinitely. We can submit plenty of evidence from paper, pulp, dye, and knitting mills, etc. Send us your inquiries for wood pipe. Let us hear from you.

DAVIS CYPRESS TANKS

G. M. DAVIS & SON
P. O. Box 5,
Palatka, Fla.

SOUTHLAND PRODUCTS

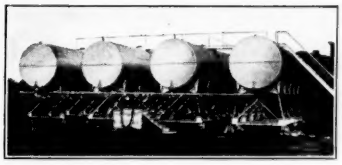
—WELDED OR RIVETED—

We now manufacture and offer to the trade tanks in all sizes for pressure or gravity work. Also other steel equipment of either

WELDED OR RIVETED CONSTRUCTION

This applies to field as well as shop built equipment.

Write us for information and quotations.



CHATTANOOGA BOILER & TANK CO.
CHATTANOOGA, TENN.

CREOSOTED TIES, PILING, POLES, POSTS, CROSS ARMS, and LUMBER

WOLMANIZED LUMBER—
Decay and Termite Proof—Can Be Painted
Docks for Ocean Vessels

American Creosote Works, Inc.
New Orleans, La.

Atlantic Creosoting Co., Inc.
Norfolk, Virginia

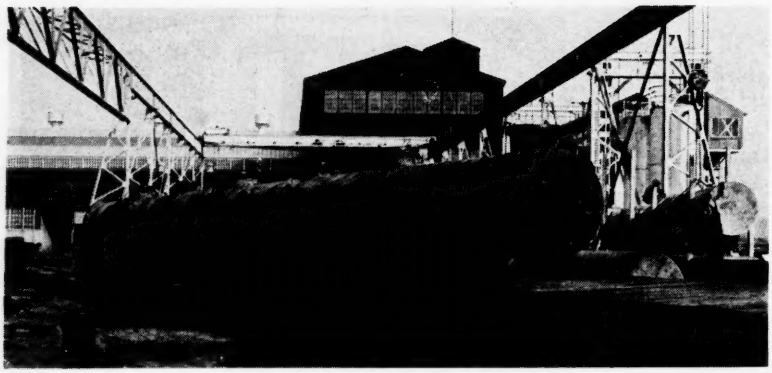
Plants at: New Orleans; Winnfield, La.; Louisville, Miss. Savannah, Ga.; Jackson, Tenn., and Norfolk, Va.

TANK HEADS

ALL STYLES TO 60" DIAMETER ONE OR A CARLOAD

Catalog on request

THE COMMERCIAL SHEARING & STAMPING CO.
YOUNGSTOWN, OHIO



A Debutanizer Tower 78′ 6″ long and with a diameter of 5-ft. made for the Gulf Oil Corporation's plant at Port Arthur, Tex., by the Chicago Bridge and Iron Company at their Birmingham, Ala., plant.

Ryerson Expands Plant

Already one of the largest steel service plants in the world, a new modern all-steel building, 75 by 555 feet, is nearing completion at the Chicago plant of Joseph T. Ryerson & Son, Inc., of that city. The new building will increase the total floor space to well over 650,000 square feet, a remarkable growth from the humble 2-story iron and steel store built in 1842 by Joseph T. Ryerson. With its 46,000 square feet of floor space, the new span is to form part of a department now containing over 300,000 square feet and will be used for storing hot rolled steel bars, shapes and plates. It will be served by two 15-ton cranes and direct railroad sidings, thus adding to the plant's shipping, receiving and handling facilities. In addition to the new unit, an extension has been erected on a 100-foot span in the concrete reinforcing steel section which increases facilities for handling and racking extra long length stock. Eight protected railroad sidings at the Chicago plant permit as many as 47 freight cars to be loaded or unloaded under roof at one time. For quick service, shipping doors have a capacity of 35 trucks, and at each door motor-driven cranes load the stock swiftly and skillfully. Ryerson operates steel-service plants in ten principal industrial centers, one of which is St. Louis, Mo., and a teletype network ties all ten into a closely knit unit, assuring a complete national service.

Correcting an Error

Due to a typographical mistake we were made to say in an editorial in January, referring to the newsprint consumption of America, it would take 876 mills of 50,000 tons capacity, which is the amount of production estimated for the Lufkin, Texas mill just started, to supply the needs of America.

The estimated demands for newsprint in this country are 4,380,000 tons per year. Clearly the number of mills of similar capacity to that at Lufkin necessary to supply this tonnage would be 87 instead of the number stated.

Concrete Bridges

Continuous Concrete Bridges is the subject of a booklet recently published by the Portland Cement Association. The booklet gives a complete design method for continuous slab and continuous girder bridges, illustrated by problems and photos of existing bridges. The design method used is based upon moment distribution, and the design procedure is so organized that a design can be made easily and quickly with a minimum chance for error. The booklet contains curves for finding fixed end moments, beam constants for variable depth members, for estimating the probable depths required for different span lengths. The booklet also contains discussions on the various features of layout, the selection of type of substructure, and other items pertinent to the use of continuous con crete bridges.

This booklet may be secured by writing to the nearest district office of the Portland Cement Association.

Naval Stores Studies

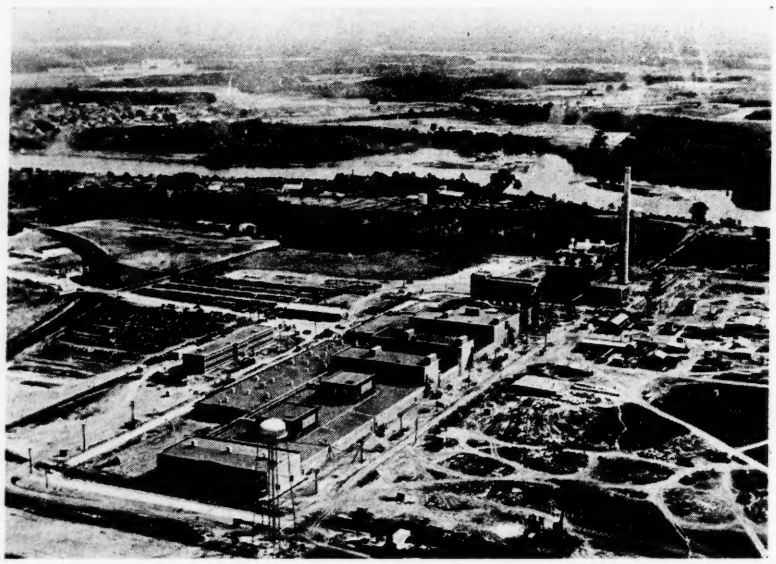
(*Continued from Page* 31)

ing adopted rapidly by the producer and distributor.

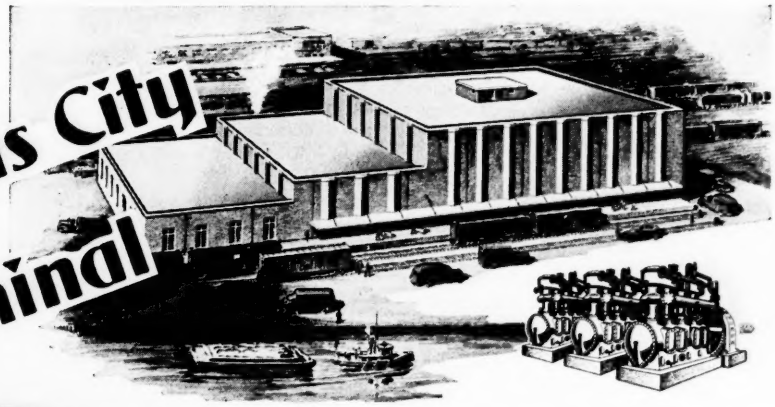
In certain consuming industries a rosin which is crystalline or has a tendency to crystallize is objectionable. While this property is not usual in gum rosin, even its infrequent occurrence is objectionable. For this reason a method has been developed in the laboratory for producing a non-crystallizing gum rosin. Samples of this product, as well as of other special rosins, will be submitted to industry for examination.

The results of the three groups of studies under its research program will be the contribution of the Naval Stores Research Division of the Bureau of Agricultural Chemistry and Engineering to the progress of the new gum naval stores industry which is on the horizon. Improved equipment and more efficient practices in production and processing should lower the cost of production. Standardized and special products should bring increased consumption in present uses. This increased consumption, together with the new markets resulting from new uses of the special products, should absorb the output of the industry at prices which will permit profit to both the producer and processor. The combined results will be improved living conditions for more than three hundred thousand people in the naval stores belt, whose standard of living depends largely upon the condition of the naval stores market, and a continued adequate supply of valuable raw materials for consuming industries.

The new nylon yarn plant of the du Pont Company just outside Seaford, Del., looking south toward the Nanticoke river. The building is one-fifth of a mile long.



Big Kansas City Food Terminal has FRICK



For cooling 1¼ million cubic feet of storage space, and freezing 160 tons of ice daily. Three big Frick 4-cylinder compressors, and a large 2-cylinder Frick machine, will carry the refrigerating load. Architect is Joseph W. Radotinsky.

For that important refrigerating, ice-making, or air conditioning job of yours, get quotations from the nearest Frick Branch Office or Distributor. They're in 150 principal cities throughout the globe. Frick Co., Waynesboro, Penna.

Refrigerating and Ice-making Equipment

STRUCTURAL STEEL *for* **BUILDINGS and BRIDGES**

Capacity 1000 Tons per Month. 3000 Tons in Stock

Carolina Steel and Iron Company

The Largest Steel Fabricators in the Carolinas

Greensboro North Carolina

S. C. Rep., Edward McCrady, 307 Allen Bldg., Greenville, S. C.

SAND—GRAVEL—BRICK

FILTER GRAVEL

Washed Sand and Gravel for Concrete Roads and Buildings

Filter Gravel, all sizes—Building Bricks

FRIEND & CO., INC. River St., Petersburg, Va.

GLAMORGAN

PIPE & FOUNDRY CO.

LYNCHBURG, VA.

CONVERSE BRIDGE & STEEL CO.

Chattanooga, Tennessee

Structural Steel for all Industrial Structures, Buildings and Bridges.

LARGE STOCK FOR IMMEDIATE SHIPMENT

CRUSHED STONE

Only highest grades of crushed

LIMESTONE AND GRANITE

Meeting all specifications

CAPACITY—8000 tons daily

Blue Ridge, Va. Pembroke, Va. Pounding Mill, Va.

Boxley, Greensville County, Va.

W. W. BOXLEY & COMPANY

Boxley Building, ROANOKE, VA.

NEW *Sewer and Culvert Construction*

By making concrete pipe on the job with Quinn Forms you give more men more work, can use less experienced labor and produce uniform concrete pipe of highest quality. Recognized standard of all concrete pipe.

QUINN PIPE FORMS

Quinn Heavy Duty and Medium Duty Pipe Forms best for hand or wet process pipe. Give more years of service. All diameters—12 to 84 inches. Tongue and groove or bell end pipe, any length.

WRITE for New Book on Concrete Pipe giving information and prices, valuable tables on production costs, strength tests, Pipe Forms, Pipe Machines, etc. Book sent free.

QUINN WIRE & IRON WORKS 1605 12 St. Boone, Iowa

Southern Highway Developments

(*Continued from Page* 48)

the center macadam section can be torn up, replaced with a neutral ground and 11-foot concrete lanes again added on the outside, producing a four-lane, divided concrete highway.

Probably the outstanding event in the secondary road field during the past few years has been the development and now wide-spread acceptance of a new low-cost, light-traffic surfacing—soil-cement.

Pioneered by the South Carolina Highway Department as early as 1932, soil-cement mixtures achieved their present success through laboratory and field research undertaken jointly by the Portland Cement Association, the South Carolina Highway Department and the Public Roads Administration. These researches, extending over a four-year period and still in progress, showed that not only could soil and cement be combined to produce an all-weather, low-cost road but, in addition, a scientific method of control was developed which removed the process from a hit-or-miss procedure. Today soil-cement construction is the direct product of laboratory control—results are completely predictable before processing.

Although scientific, both laboratory and construction procedures are simple. The following is a brief summary of construction methods:

1. Existing earth, old gravel or crushed stone road is scarified to a depth of about 6 inches.
2. Scarified material is pulverized with offset disc harrows or other satisfactory equipment.
3. A predetermined amount of portland cement is spread evenly over the surface.
4. Portland cement and pulverized earth are mixed with disc harrows, heavy duty field cultivators and gang plows or other satisfactory equipment.
5. Necessary water is added with a pressure distributor and uniformly mixed with the soil and cement, using the same equipment as for mixing soil and cement.
6. Sheeps foot rollers pack the mixture from the bottom up to required uniform density.
7. Blade grader shapes section to the required grade and crown; spike-tooth harrow scratches out top compaction planes.
8. Smooth-wheel tandem roller irons out the final surface, which is then protected from rapid evaporation for a short period with damp straw, hay or earth.

The outstanding soil-cement highway job of 1939 was a 23-mi. section between Pontotoc and Houston in north Mississippi. Construction was by the machine mix method, as high as 3,000 lineal feet of 22-ft. highway having been processed in one day. (Fig. 7.)

In street work Columbia, South Carolina's, 450,000 sq. yd. of street paving program was particularly outstanding. This work was done by the mixed-in-place method outlined above, and averaged $.47 per sq. yd. in cost. (Fig. 8.)

Altogether, 1,900,000 square yards of soil-cement were put down during 1939. This is a 45 per cent increase over 1938. Similar or greater gains are expected in 1940.

If, in the next few years we can continue and speed up the signs of progress evidenced by the few projects here described . . . if everyone, from the humblest citizen to the highest business executive, can be made to realize

—the terrific cost of inadequate highways;

—that we can't stop highway deaths and highway accidents merely by education or law enforcement, but that we must build safety into highways;

—that we can't cure traffic congestion and its attendant inconvenience, time loss and cost by merely wishing to do it, and that we must build facilities to end congestion;

—that state by state, sound highway programs integrated into a national highway program, which will bring about safe and convenient highway use, must be set up;

—and that all the motor imposts the road user can afford to pay are needed to realize these ends;

then we need have no fear for the South's highway future.

To paraphrase a truism, the price of progress is eternal effort. Intelligent, sustained effort was never more needed than now if 25 years from today we are to have attained the promise of American life implicit in such prophetic forecasts as General Motors' stirring futurama, "Highways and Horizons."

Kansas City Life Insurance Company Adds to Growth

The 45th annual statement of the Kansas City Life Insurance Company shows insurance in force of $447,507,267, the largest in the history of the company.

Legal reserves are $103,115,640; admitted assets $112,482,489.14, and surplus assets $7,205,983.56. There were paid to policyholders and beneficiaries during the year $8,738,657.98.

W. E. Bixby, president, states: "The sound and conservative investment policy which has been pursued in the past will be continued."

Government bond holdings exceed $30,000,000, and in its portfolio are more than $20,000,000 of state, county and municipal bonds, besides nearly $1,500,000 worth of cash in banks.

New Way to Encourage Cleanliness

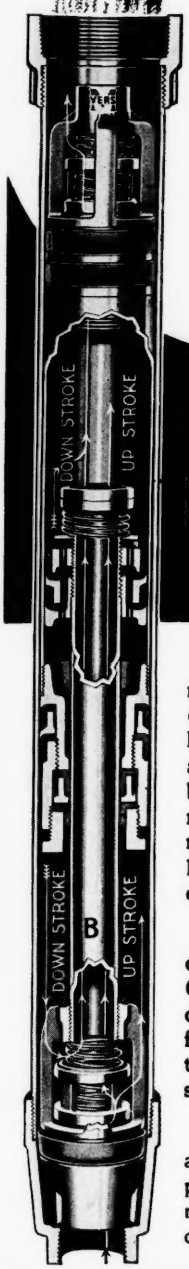
The quaint character pictured below has proven a painless, effective solution to one of Industry's paramount operating problems—that of promoting safety and efficiency through plant cleanliness.

"Sloppy Sam" is the unkempt gentleman's name, and he's a brain-child of the Plant Inspection Committee in the Buffalo, N. Y., steel service plant of Joseph T. Ryerson & Son, Inc. Sam is given lodging in departments proclaimed substandard by the Committee during their weekly inspection tours. His visits evoke good natured chiding from members of other departments who in turn make a definite effort to keep their departments clean so the unwelcome visitor will have no reason to call on them. The results of this humorous approach to the cleanliness problem were so favorable that duplicates of Sam were made for the company's other plants. The figures are flame-cut by Ryerson from rolled steel plate and painted in bizarre colors.

"Sloppy Sam"

As cleanliness is a definite contribution to safety and efficiency in any Industry, Ryerson's successful sugar-coated approach to this problem can undoubtedly be used to advantage by operating departments in almost every factory or plant.

A GUSHER of SALES and Satisfaction with MYERS DOUBLE ACTING CYLINDERS

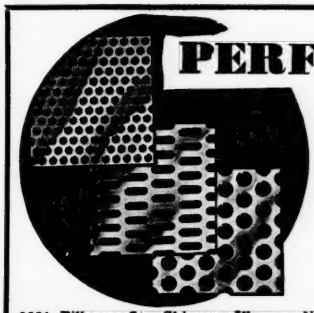


Today Myers brings you the most modern, the most dependable double acting cylinders on the market. There is nothing experimental about them. Designed by experts, built to precision standards, their reputation for dependable and economical service is firmly established in pump circles the country over.

Whether conditions are regular or otherwise, Myers Double Acting Cylinders satisfactorily solve most deep well pumping problems. They furnish the plus volume of water that lowers pumping costs and satisfies the most critical of users.

If you require more water from any source at lower cost than is possible to secure by ordinary methods write us for circular and complete information.

THE F.E. MYERS & BRO. CO.
ASHLAND, OHIO
PUMPS–WATER SYSTEMS–HAY TOOLS–DOOR HANGERS



PERFORATED METAL

of every sort

for Screening, Grading, Ventilating or any industrial purpose. Also Grilles of many beautiful designs.

5631 Fillmore St., Chicago, Ill. New York Office: 114 Liberty St.

The Harrington & King PERFORATING Co.

HENDRICK
PERFORATED METALS

Screens and grilles
in all commercially rolled metals,
all standard and special designs.
Write for literature
HENDRICK MANUFACTURING CO.
44 Dundaff Street, Carbondale, Pa.
Manufacturers of Mitco Open Steel Flooring, Mitco Shur-Site Treads and Mitco Armorgrids.

ERDLE PERFORATED SHEET METALS

SIXTY YEARS' experience in Metal Perforating is your assurance of a satisfactory job.
Made to your specifications and shipped promptly.
Metal Sample Plate on Request.
ERDLE PERFORATING COMPANY,
171 York Street, Rochester, N. Y.

PERFORATED METALS

For every purpose, Industrial and Ornamental

Steel, Stainless Steel, Monel Metal, Brass, Copper, Bronze, Aluminum, Zinc, Lead, Tin Plate and all other metals or materials perforated as required, and for all kinds of screens. Send for new Catalog.

CHARLES MUNDT & SONS
490 Johnston Ave., JERSEY CITY, N. J.

MICA PRODUCTION IN NORTH CAROLINA

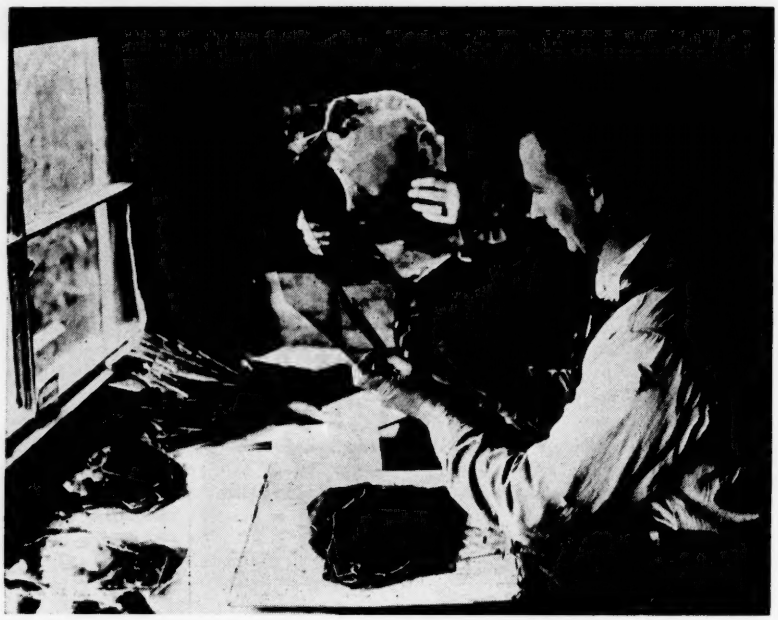
"BILLY, run up to that old mine on the side of the mountain and split off three or four sheets of mica—I want to fix those window panes."

This might have been said by a mountain mother to one of her boys back in the North Carolina mountains yesterday —or a hundred years ago, since large sheets of mica have been used in the mountains for 100 years or more as window panes in their cabins. In many sections of North Carolina mica can be had merely for the effort of digging it out of the mountainside.

But the supplying of mica for window panes in mountain cabins is now an incidental angle of the mica industry in North Carolina, which now produces approximately half of the mica, both sheet and scrap, used in the entire United States. It leads all the other states in the production of schist and scrap mica, including vermiculite. Six types of vermiculite are found in the state. It is a bronze-colored hydrous mica which expands when heated, and is used extensively in the manufacture of heat resisting plasters and concrete, refractory brick and insulating material.

North Carolina ranked ahead of all other states in the production of mica in 1930. Production then declined until 1934 but has been increasing steadily again since that year. The production of sheet mica has declined since 1929 but the production of scrap and schist mica has steadily increased, amounting now to more than 12,000 tons a year. At present, the production of scrap and sheet mica in North Carolina is estimated at considerably more than 15,000 tons a year, according to the latest figures available.

For the calendar year 1938 the production of sheet mica in North Carolina amounted to 632,646 pounds, valued at $87,879 while the production of scrap mica was 11,959 tons with a value of $161,598. There are 22 mica producing concerns operating in North Carolina at present, with eight mica grinding plants in operation. Most of the kaolin clay plants also operate scrap mica recovery plants, since a large amount of scrap mica is found in many of the kaolin deposits and is recovered as a by-product in the clay-washing plants. One large kaolin mine and mill near Spruce Pine has a scrap mica recovery plant which extracts approximately 25 tons of mica a day from kaolin clay.



Taken out of the ground in chunks, mica is peeled into thin, transparent sheets and then graded according to quality and size. Large pieces are used as "windows" in heaters. Smaller pieces go into electrical equipment, and some of it is ground into powder for mixing in paints and other purposes.

Mica, including the vermiculites, is used in many different ways in industry, usually when ground to various sizes. The larger sizes, from a quarter of an inch to 20 mesh, is used for insulating houses, refrigerators, in safe and vault linings, automobile mufflers, pipe coverings, to make boiler lagging, smelter ladles, refractory brick and insulation cement. When ground from 20 to 40 mesh size, mica is used in insulating automobiles, airplanes, refrigerator cars, water coolers, cold storage plants and in insulating railroad coaches. It is also used in the manufacture of fire extinguishers, filters of various kinds of annealing steel.

When bolted to a still finer texture (40 to 120 mesh) ground mica is used in the manufacture of linoleum, shingles, wall board, cornice boards and dielectric switch boards. Still finer grades (120 to 200 mesh) are used in the manufacture of automobile tires and other rubber goods, in grease lubricants and in the manufacture of bakelite products. Grades capable of being bolted through 200 to 270 mesh are used in the printing of wall paper, outdoor advertising paints, in the manufacture of fireproof cartons for the transportation of films and for building up viscosity in oil.

The biggest domestic field for the use of mica at present, however, is for insulating houses, office buildings and factories as it is an insulator against both heat and sound.

Reprints available

"Mineral Production of the South"

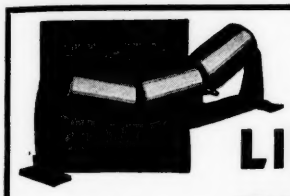
by

Dr. George C. Branner

In the form of a 12 page, 9x12, pamphlet with maps, charts, and tabulations of the mining resources of the sixteen Southern States.

Fifteen Cents A Copy

Manufacturers Record, Baltimore, Md.



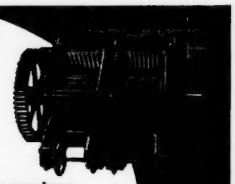
LINK-BELT
ANTI-FRICTION
BELT CONVEYOR IDLERS

Send for Catalog

are free turning — accurately made. They assure the belt conveyor a good roadbed for economical operation . . . minimum friction loads . . . long belt life . . . and the lowest maintenance cost. Send for catalog.

LINK-BELT COMPANY, ATLANTA, PHILADELPHIA, DALLAS, BALTIMORE NEW ORLEANS 7608-A

McLANAHAN EQUIPMENT
ROCK—SAND—GRAVEL



Single and double roll and jaw crushers, hammer mills, super dry pans, steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists. Complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.

McLanahan & Stone Corporation
Established 1835
Hollidaysburg, Pennsylvania

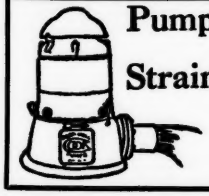
MOUNT AIRY GRANITE
Peerless Beauty and Strength

THE NORTH CAROLINA GRANITE CORP'N.
Mount Airy, N. C.

FINE GEARS of all Materials—All Types and Sizes
Spur Gears—½ in. to 30 ft. in diameter
Bevel Gears—½ in. to 13 ft. in diameter
Spiral Gears—½ in. to 10 ft. in diameter
Worm gears any practical size. Racks curved or straight. Fast Delivery—Fair Prices.

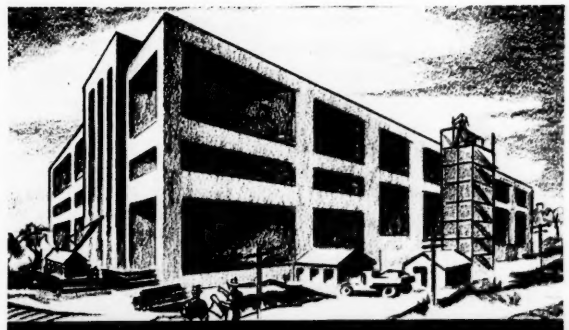
THE EARLE GEAR & MACHINE CO.
4719 Stenton Ave., Philadelphia, Pa.
149 Broadway, New York City

EARLE GEARS



Pumps—Deep-Well Plunger and Turbine
Strainers—and other well supplies
WATER PRESSURE SYSTEMS
A. D. COOK, Inc.
Lawrenceburg, Indiana

Ornamental and Industrial
PERFORATED METALS
We carry a large stock for immediate shipment.
Send for Our Catalogue.
Manhattan Perforated Metal Co., Inc., 43-17 37th St., L. I. City, N. Y.



They Ask Layne BEFORE THEY BUILD

Large and small industries, as well as municipalities, consult with Layne about Well Water Supplies before designing and constructing new buildings, additions or extensions to existing facilities. The reason is obvious. Like gold, water is where you find it. Layne engineers score amazingly high records in selecting sites where ground water may be produced. Furthermore, many decades of world wide experience in developing well water supplies enables them to prove the adequacy and permanence of the supply before the wells are constructed.

AFFILIATED COMPANIES
LAYNE-ARKANSAS CO. STUTTGART, ARK.
LAYNE-ATLANTIC CO. . . . NORFOLK, VA.
LAYNE-CENTRAL CO. . . MEMPHIS, TENN.
LAYNE-NORTHERN CO. . MISHAWAKA, IND.
LAYNE-LOUISIANA CO. LAKE CHARLES, LA.
LAYNE-NEW YORK CO. . NEW YORK CITY AND PITTSBURGH . . . . . PA.
LAYNE-NORTHWEST CO. MILWAUKEE, WIS.
LAYNE-OHIO CO. . . . COLUMBUS, OHIO
LAYNE-TEXAS CO. . . . HOUSTON AND DALLAS . . . . . TEXAS.
LAYNE-WESTERN CO. . KANSAS CITY, MO. CHICAGO, ILL. . . . OMAHA, NEBRASKA
LAYNE-WESTERN CO. OF MINNESOTA MINNEAPOLIS . . . . . MINN.
LAYNE-BOWLER NEW ENGLAND COMPANY. BOSTON . . . . . MASSACHUSETTS.
INTERNATIONAL WATER SUPPLY, LTD. LONDON . . . . . ONTARIO, CANADA

From the selection of the site, through the drilling of the wells, supplying and installing proper pumps, to the test and completion of the system, Layne handles the entire job. This plan eliminates the problem of divided responsibility. It insures complete satisfaction.

For free bulletins, address
LAYNE & BOWLER, INC.
Dept. X-1, Memphis, Tennessee

LAYNE

PUMPS & WELL WATER SYSTEMS
For Municipalities, Industries, Railroads, Mines and Irrigation

National Rivers and Harbors Congress

Drastic discriminatory budget slashes in the amounts recommended for rivers and harbors and flood control projects, far in excess of cuts for other items, and far in excess of the amounts recommended by the War Department, will make the 35th annual convention of the National Rivers and Harbors Congress the greatest in its history when it meets at the Mayflower Hotel in Washington, D. C., on March 14 and 15.

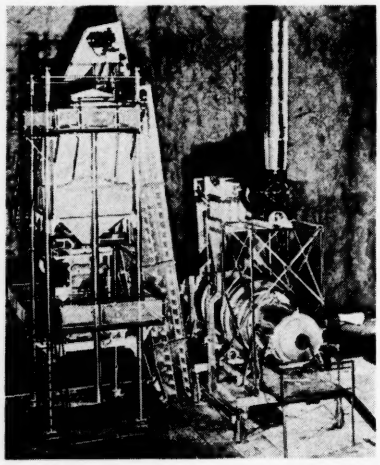
Whereas the Chief of Army Engineers has reported that $73,226,800 could be profitably expended on new river and harbor work during the next fiscal year and $206,624,000 for flood control projects throughout the United States, these recommendations have been reduced more than one-half by the Budget Bureau which requested only $25,000,000 for rivers and harbors and $70,000,000 for flood control.

Commenting on these cuts, the Congress said that it had no quarrel with the President's desire to balance the budget, but that it does object to discriminatory cuts on these natural-resources-conserving projects, particularly in the face of recommendations by the War Department.

The National Rivers and Harbors Congress is composed of Senators, Congressmen, and leading waterway experts throughout the nation, and is the only nationwide organization devoted to development of waterways. Congressman Dewey Short of Missouri is President.

Asphalt Plant Model

Something new in the way of models has been developed by the Simplicity System Company of Chattanooga, Tennessee, the only manufacturer of asphalt plants alone. Below is an illustration of their new complete working model of a full size asphalt plant. Constructed of stainless steel, aluminum, Monel metal, and Lucite (plastic), it is built on a scale of one to eight and was built to show the working of an asphalt plant in action. By feeding in a mixture of shelled corn, grits, meal and rice to the automatic feeder, the action of the mixture in passing through the Simplicity Double-Shell dryer can be watched, and from there, as it passes into the hot elevator to screen on top of tower and the actual screening operation and separation into bins. It has working model size Kron scales for weighing batches of material. The model plant took about one and one-half years to construct and cost nearly $10,000.

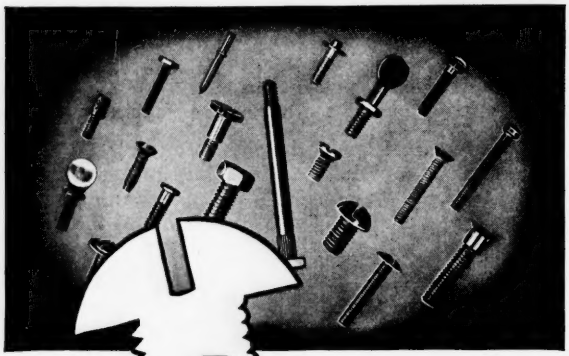


1939 Is Biggest Construction Year in New Orleans Since 1926

Construction in New Orleans during 1939 established new records for recent years.

The 1939 total of construction contracts was $14,997,000, the biggest building year that city has experienced since 1926. Furthermore, there were 806 residential structures built during 1939 with a value of $3,245,000 which represented the largest year for residential construction in more than a decade and a notable increase over 1938 when 574 residences

(*Continued on Page* 61)

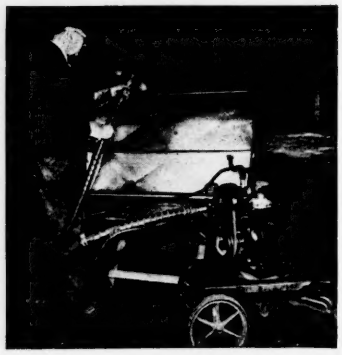


PROTECT your product — and reduce costs — at every point where fastening devices are required by using screws and headed parts by PROGRESSIVE. Let PROGRESSIVE items, produced efficiently and accurately by the cold upset process, show you the way to substantial savings both in original costs and in assembly operations. In addition to standard machine screws and nuts, PROGRESSIVE is equipped to meet demands for made-to-order parts in any metal. We invite you to submit your problems to PROGRESSIVE specialists for intelligent, prompt solution.

QUALITY PROMCO BRAND

The PROGRESSIVE MFG. CO.
TORRINGTON · · · CONNECTICUT

POLISHING STAINLESS STEEL



Strand

FLEXIBLE SHAFT MACHINES
1/8 to 3 H.P.

For Grinding, Polishing, Buffing, Sanding, Drilling, Rotary Filing, Reaming, Nut Setting, Screw Driving, etc.

Send for Catalog

N. A. STRAND & CO.
5001 No. Wolcott Ave., Chicago

SCREW MACHINE PARTS

from STEEL · BRASS · STAINLESS-STEEL

May we solve your screw machine problems?

SAMUEL J. SHIMER & SONS
MILTON, PENNSYLVANIA.

GALVANIZING
Have it done by Philadelphia's OLDEST, the Country's LARGEST
—HOT DIP JOB GALVANIZER—
Joseph P. Cattie & Bros., Inc.
Gaul & Letterly Sts., Philadelphia, Pa.
GALVANIZED PRODUCTS FURNISHED

CANNING MACHINERY
FOR
FRUITS·VEGETABLES·FISH·CITRUS FRUITS·ETC.
A.K.ROBINS & CO.INC. BALTIMORE, MD.
WRITE FOR CATALOGUE

While cosmopolitan in its general appeal, and modern *up to this moment* in its equipment, there is a peculiar flavor of The Old South here which Southerners are quick to note and appreciate. They feel at home and come back to us again and again.

Rates $3.00 *per day and up. Every room with bath or shower. Centrally located.*

The Southern Hotel
BALTIMORE

FINEST . . *for Every Purpose*

Victoria
TOILET TISSUES

Craftsmen in the art of fine paper-making for 60 years.

•

Distributed by Reliable Paper Merchants everywhere.

Made by
VICTORIA PAPER MILLS COMPANY
Founded 1880.

FULTON, NEW YORK

1939 Construction in New Orleans

(Continued from Page 60)

were constructed at a cost of $2,176,760.

The residential structure figures do not include three low-rent housing projects that are sponsored by the Federal government and which amounted to almost 9 million dollars in 1939. The low-rent housing projects are included in the 15 million dollars construction contracts as are also the Tulane Stadium addition ($500,000), the new Woolworth store, the new Federal office building and the United States Agricultural Laboratory.

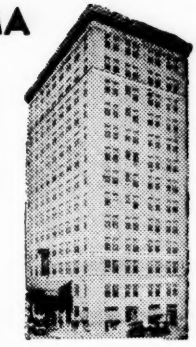
Neither building permits nor recorded contracts cover construction in the New Orleans metropolitan area adjacent to but outside the city limits. This construction would add about $1,000,000 to the figure.

1940 prospects in the construction field are particularly bright. Contracts will be let for three more slum clearance projects costing about 12 million dollars, several large industrial plants are to be erected, and numerous subdivisions, some of which will be on an elaborate scale, are scheduled.

TOOL GRINDERS AND BUFFERS— Folder—illustrating and describing the Cincinnati General Purpose Grinders and Buffers with the Cincinnati "Air Master"; Bulletin No. 129-B.
The Cincinnati Electrical Tool Company, Cincinnati, Ohio, Division of The R. K. LeBlond Tool Company.

CLAY WORKING MACHINERY
FOR BRICK, TILE AND BLOCK,
FROM SMALLEST TO LARGEST CAPACITY.
Write for information
J. C. STEELE & SONS, STATESVILLE, N. C.

BIRMINGHAM
ALABAMA



250 OUTSIDE ROOMS
250 BATHS with SHOWERS
RADIO IN EVERY ROOM
CIRCULATING ICE WATER IN EVERY ROOM
AIR CONDITIONED COFFEE SHOP
FRANK (PETE) WOODS, Manager
A. P. REICH, Managing Director

BIRMINGHAM'S MOST MODERN HOTEL
HOTEL REDMONT

Resale Department

MACHINERY EQUIPMENT SUPPLIES

-TRANSFORMERS-

SALES AND REPAIR SERVICE

6—450 KVA Gen. Electric Transformers
2400/4800—120/240 volts.

$800.00 EACH

We carry a complete stock. *Write for Catalog No. 134-E*

All transformers guaranteed for one year.

WANTED: Transformers, burned-out or in operating condition.

THE ELECTRIC SERVICE COMPANY, Inc.

"America's Used Transformer Clearing House" **"Since 1912"**

Station M. Cincinnati, Ohio

FOR SALE

1000 Tons—70 lb. Rail, Switches, Angle Bars and Plates.
500,000 C. M. Cable, Bare.
500,000 C. M. Cable, Insulated.
300,000 C. M. Cable, Bare.
4/0 Stranded Cable, Insulated.
4/0 Solid Cable, Insulated.
4/0 Round Trolley Wire.
7 W. H. Rotary Converters.
1 G. E. Rotary Converter.
And complete equipment for (4) substations.

CHARLESTON TRANSIT COMPANY
Charleston, West Virginia

AC MOTORS

40 HP. 1800 RPM. 3/60/220, Gen. Elec. FT
60 HP. 3600 RPM. 3/60/220, Fairbanks-Morse
75 HP. 1800 RPM. 3/60/440, Gen. Elec. KT
100 HP. 720 RPM. 3/60/220, West'house CW
150 HP. 900 RPM. 3/60/440, Gen. Elec. IM
150 HP. 720 RPM. 3/60/2200, Gen. Elec. MT

AC GENERATORS

15 KVA. 1200 RPM. 3/60/2300, Fairbanks-Morse
85 KVA. 1200 RPM. 3/60/220, Allis-Chalmers
300 KVA. 600 RPM. 3/60/440, General Electric

GASOLINE GENERATOR

5 KVA. 3/60/220 Volt AC generator dc. to Le Roi gasoline engine.

AIR COMPRESSORS

9x8 Chicago Pneumatic type NSB, 173 CFM.
14x12 Ingersoll-Rand 60# max. 317 CFM.

CENTRIFUGAL PUMPS

6" Lane-Bowler—25 HP. 3/60/220 V. Gen. Elec. mtr.
12" Cameron Volute 4170 GPM. 170' head. 250 HP. 3/60/440 V. Gen. Elec. slip ring motor.

Rockford Electric Equipment Co.
729 South Wyman St. Rockford, Illinois

TRANSFORMERS

WE SELL -- PURCHASE -- RENT
Power & Dist. Transf. from one to 5000 KVA. Any Volt. or Frequency.
Catalogue & Prices On Request
PHILADELPHIA TRANSFORMER CO.
2829 Cedar St. Phila., Pa.

DIESEL ENGINE

360 HP. Fairbanks Morse full diesel engine, vertical 6 cylinders type Y, style VA, 14" bore, 17" stroke, 257 RPM., belted type with clutch and pulley between pedestals.
Can be direct connected to an electric generator.

UNIFLOW UNIT

250 KW. Burke generator direct connected to a 360 RPM., 4 cylinder Ames vertical uniflow steam engine.

Large stock motor generators, transformers, turbo generators, etc.

GEORGE SACHSENMAIER CO.
8407 Hegerman St. Philadelphia, Pa.

REBUILT

MOTORS and GENERATORS

MOTOR REWINDING

V-C ENGINEERING CO., INC.
1004 MAIN ST., NORFOLK, VA.
Write for Catalogue No. 17

MOTORS
TRANSFORMERS
M. G. SETS
PUMPS
EXHAUST-FANS

We have what you want at lower prices

WIRE, WRITE, PHONE

Erie Electric Motor Repair Co., Inc.
112 Church St., Buffalo, N. Y.

WE BUY AND SELL

Power Plants, D.C. and A.C. Motors, Generators, Transformers, Pumps and Elec. Instruments. Give us the opportunity of bidding. NOTE: We carry a diversified stock, and your inquiries will receive immediate attention. Satisfaction guaranteed.

Superior Electric Machinery Co.
2829 Cedar St. Phila., Pa.

ALBERT & DAVIDSON PIPE CORP.

PIPE
NEW-USED-UNTESTED
2nd Ave. 50th-51st St. EST. 1904 Brooklyn, N.Y.

FOR SALE

200 HP McIntosh & Seymour, 4 cyl., 4 cycle, Diesel Engine, direct connected 2300 Volt. 150 KW G.E. Generator, Westinghouse exciter, G.E. switchboard, transformers, etc. Operated only short time. A-1 condition.

W. E. WILLIMON
Box 161 Greenville, S. C.

NEW PIPE USED

For Every Purpose

Large stocks carried everywhere for spot shipment

JOS. GREENSPON'S SON PIPE CORP.
National Stock Yds., (St. Clair Co.) Ill.

200 & 300 KW Skinner Uniflows. 220-440-2300 volt.
2—778 HP B & W Watertube Boilers. 200 lbs.
40, 60, 100, 180, 240, 360 HP Fairbanks Diesels.
120 HP Atlas Imperial 6 cyl. full Diesel Engine.
150 HP Buda 6 cyl. Power Units. Gasoline or Oil.
25 & 35 ton Plymouth std. ga. Gas Locomotives.
100, 150, 200 & 300 KW Motor Generator Sets.

Steel Sheet Piling—Rail—Tanks—Pipe—Boilers

Mississippi Valley Equipment Co.
505 Locust St. St. Louis, Mo.

WE BUY AND SELL
AND CAN SHIP FROM STOCK

Motor Generators, Rotary Converters, Transformers, Air Compressors, Battery and Trolley Locomotives, Motors, Wheel Presses, Coal Crushers.

WALLACE E. KIRK COMPANY
Incorporated
502-I Grant Building Pittsburgh, Pa.

PIPE
NEW-USED RECLAIMED FROM 1" to 12"
Cut to Stretch and Stocked
ALBERT PIPE SUPPLY CO. Inc.
Berry and North 13th St Brooklyn, N.Y.

ARC WELDER

750 Amp. 45 K.W. Westinghouse, Type S. K. C. W., 60 vo., 1160 RPM. Direct connected to 70 H.P. Westinghouse Type C. S. 3 ph., 60 cy., 220/440 volt Motor—Unit Base.

MACHINE TOOLS

BOILERS AIR COMPRESSORS

ELECTRIC WELDERS

DELTA EQUIPMENT COMPANY

148 N. 3d Street, Phila., Pa.

2 New KW Gasoline Light Plants—25-110 V DC
110 & 300 CFM Portable Air Compressors
Eagle Swintex Cutters—35', 8"—50', 10"—45', 15" pipe
375—2000 KW 2300V Turbo Generator Sets
250 KW Uniflow Engine Generator Set 2300 V
105-125 HP 6 cyl. Buda Marine Diesel 1200 RPM
185 HP Venn Severin 3 cyl. type D Semi-Diesel Eng.
Cranes, Crushers, Screens, Motors, Generators, Mills, etc. **Ask for Bulletin #49.**

MID-CONTINENT EQUIPMENT CO.
710 Eastgate St. Louis, Mo. Pa. 2290

PIPE

Reconditioned pipe, new threads and couplings, all sizes, ¾ in. to 36 in., guaranteed suitable for all practical purposes.

MARINE METAL & SUPPLY CO.
167 South Street, New York City

IN LIQUIDATION

Skinner Unaflow Engine Generator 380 KW. 3/60/500 HP. 164 RPM. Also other AC and DC units Steam and Diesel.

STEPHEN A. DOUGLASS CO.
660 Fort Washington Ave.
New York, N. Y.

NEW AND USED

PIPE

NEW THREADS AND COUPLINGS

GREENPOINT IRON & PIPE CO. INC.
Stagg & Bogart Sts., Brooklyn, N. Y